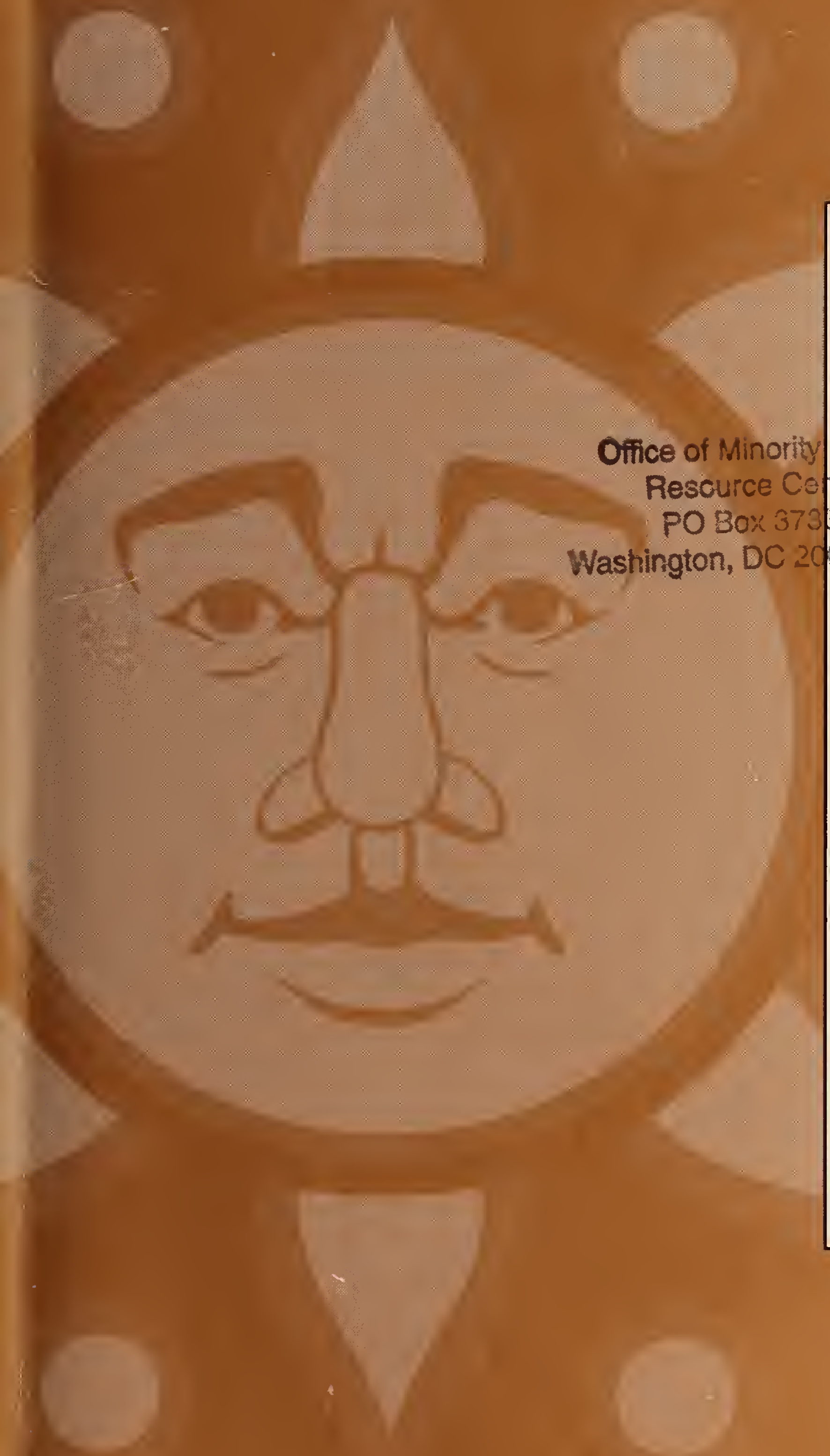

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Building Understanding To Prevent and Control Diabetes Among Hispanics/Latinos

Selected Annotations
September 1996

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control and Prevention
National Center for Chronic Disease Prevention and Health Promotion
Division of Diabetes Translation

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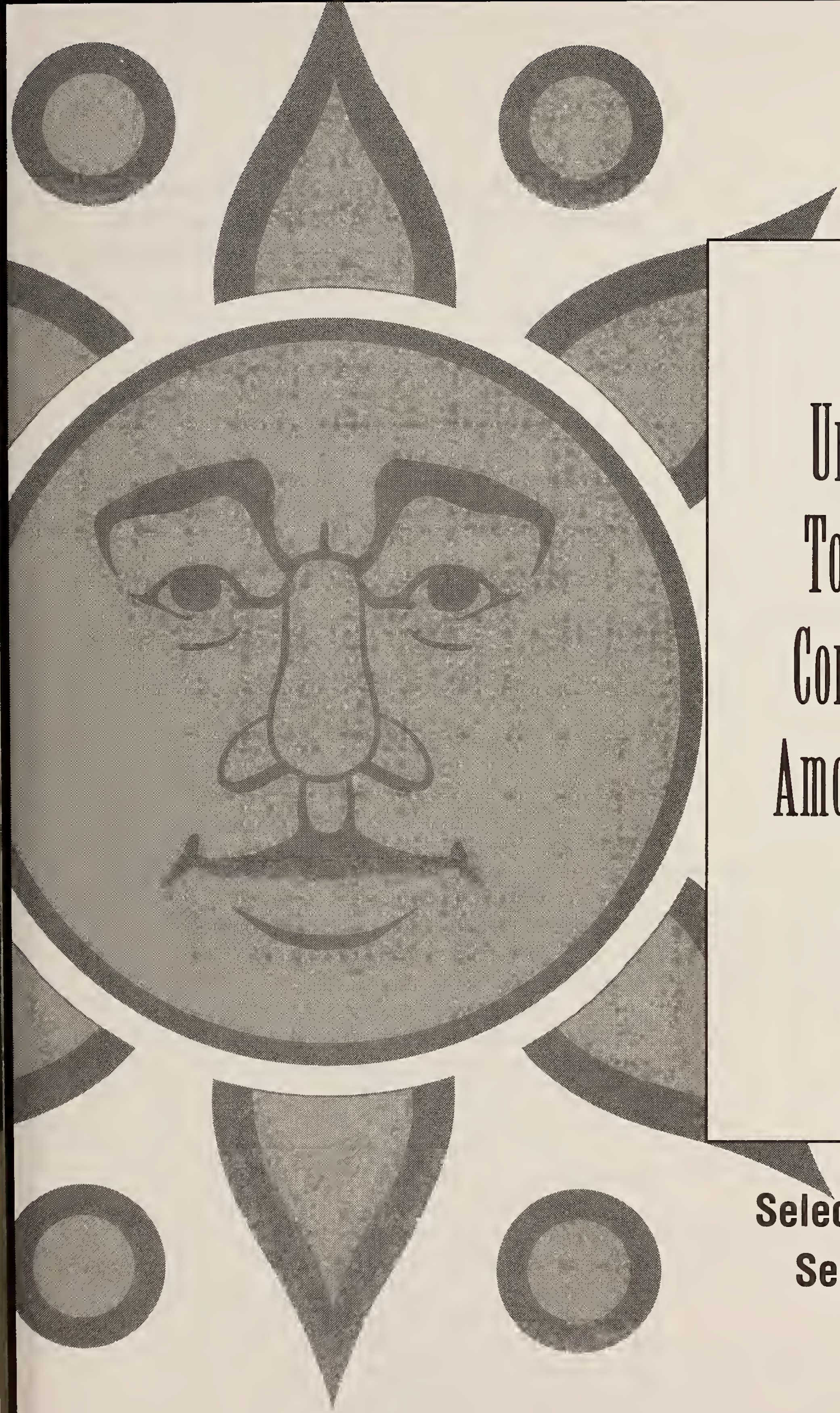

Building Understanding To Prevent and Control Diabetes Among Hispanics/ Latinos

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Building Understanding to Prevent and Control Diabetes Among Hispanics/Latinos: Selected Annotations

Table of Contents

Preface iii

How to Use v

I. Overview of the Hispanic/Latino Populations

A. Demographics 1

B. General Hispanic/Latino Health Context Issues and Considerations
  1. Culture, cultural norms, and linguistics 7
  2. Socioeconomics 19
  3. Education 23
  4. Religion (role of) 25
  5. Age 27
  6. Gender 31
  7. Other 35

II. Diabetes Burden Among Latinos: Description of Health Status and Sociocultural Variables

A. Defining the Burden: Sizing the Problem of Diabetes Among Hispanics/Latinos

1. Descriptions of diabetes morbidity and/or mortality among Hispanics/Latinos

    a. Insulin dependent diabetes mellitus (IDDM), Type I 37
    b. Noninsulin dependent diabetes mellitus (NIDDM), Type II 49
    c. Gestational diabetes 69

2. Risk and protective factors for NIDDM

    a. Diet and nutrition 75
    b. Physical activity/exercise 79
    c. Serum lipids 81
    d. Obesity and adiposity distribution 85
    e. Syndrome X 95
    f. Genetic predisposition/ethnic admixture 97
    g. Impaired glucose tolerance and hyperinsulinemia 105
    h. Other 111

3. Diabetes complications

    a. Cardiovascular disease 113
    b. Metabolic disturbances (diabetic ketoacidosis, hypoglycemia) 121
    c. Nephropathy (end-stage renal disease) 123
    d. Neuropathy and foot problems 129
    e. Peripheral vascular disease/foot problems 131
    f. Pregnancy-related 133
    g. Retinopathy 135
    h. Gallbladder disease 139

B. Biomedical Research 143

C. Diabetes Clinical Control
  1. Diagnosis/screening 151
  2. Treatment 157
  3. Prevention of diabetes complications 159

D. Psychosocial Aspects of Diabetes
  1. (Descriptions of) Diabetes knowledge, attitudes, beliefs, and practices influencing the personal health-related behaviors of Latinos/Hispanics 163
  2. (Descriptions of) Challenges, barriers, and obstacles to effective personal diabetes prevention and management 165
  3. Family and other social supports 169
  4. Coping with disease 171

III. Interventions

A. Theoretical Models 173

B. Programs (community-based/health system interventions/government) 175

C. Strategies and Approaches
  1. Diabetes self-management 177
  2. Information/education/awareness 179
  3. Nutrition 181
  4. Support groups/walking groups 183

D. Health Care Delivery System Issues
  1. Medical insurance, coverage, and reimbursement 185
  2. Access to care 191

E. Policy/Legislation (health care reform, etc.) 195

APPENDIXES

State-based Programs to Reduce the Burden of Diabetes 197

National Latino Expert Consultant Group Members 211

National and Regional Minority Organizations Hispanic/Latino Constituency 213

INDEXES

Title Index 215

Author Index 221

Subject Index 227

Preface

It is expected that by the year 2020, Latinos will be the largest minority population in the United States. The United States will have the third largest Latino population in the world, after Mexico and Brazil. Even though health statistics are sketchy for Latinos, all available information delineates an alarming picture. In particular, emerging data about the impact of diabetes in the Latino population are bringing into focus the health disparities experienced by this diverse group. An estimated 2.5 million Hispanic adults in the United States have diabetes—about 1 in 10 persons, or about twice the proportion that is found in the general U.S. population. Over the age of 45, rates in the Hispanic population go up to one out of every four. In 1990, diabetes was the fifth leading cause of death among U.S. Hispanic females, and the seventh leading cause among U.S. Hispanic males.

The absence of periodic, representative data with which to monitor trends in diabetes and its complications is a major obstacle to public health planning, assessment, implementation, education, evaluation, and communication. This lack of information also impedes efforts to monitor progress toward achieving national goals or other indices. Gaps in health data on minorities encompass all major areas of health statistics, including population and health status, health resources, health care utilization, health care expenditures, and program management.

Efforts to reduce the burden of diabetes in the Hispanic population require not only scientific investigation but also education and training among persons with diabetes and among health and other professionals who deliver diabetes care. An equitable and efficient system is needed in which clinical, public health, and community activities can join in the goal of reducing the burden of diabetes. The development of new and transferable programs, approaches, and materials for individuals and families with diabetes, for professionals, and for communities is critical.

A thorough literature review of the diabetes and related health status of Hispanics/Latinos is a pertinent and compelling first step toward addressing these issues. To that end, this annotated bibliography includes 195 abstracted articles.

This publication is the product of the collaboration and support of many individuals, notably Claudia Martínez, MPH, Leandris Liburd, MPH, and Rita Díaz-Kenney, RD of CDC's Division of Diabetes Translation. The division's National Latino Expert Consultant Workgroup members also provided input and review of this document; this group of national leaders was convened at the end of 1995 to provide expert guidance to the division, as it embarks in its Latino Diabetes Initiative for Action.

How to Use This Publication

Arrangement of Items

Items in this publication are arranged in eleven sections: (1) Demographics; (2) General Hispanic/Latino Health Context Issues and Considerations; (3) Defining the Burden: Sizing the Problem of Diabetes Among Hispanics/Latinos; (4) Bio-Medical Research; (5) Diabetes Clinical Control; (6) Psychosocial Aspects of Diabetes; (7) Theoretical Models; (8) Programs (community-based/health system interventions/government); (9) Strategies and Approaches; (10) Health Care Delivery System Issues; and (11) Policy/Legislation (health care reform, etc.).

The sections are divided into several parts. Items in each part are listed in alphabetical order by title. The items are numbered sequentially, beginning with 001.

Indexes

This publication contains three indexes. The *Title Index* lists document titles. The *Author Index* lists personal and corporate authors. The *Subject Index* lists selected key words describing the content of publications. If you know the title of a publication, use the *Title Index.* If you are looking for a publication produced by a particular person or agency, use the *Author Index.* If you want to identify items in a specific subject area, such as diabetes education programs, use the *Subject Index.*

Data Elements

A citation and abstract are listed for each item in this publication. Data elements include the item number, title, form, author or corporate author, source, and abstract.

Sample Description:

Item Number	075
Title	**Diabetes in Pregnancy in Mexican Americans**
Form	Journal article.
Author	Hollingsworth, D.R.; Vaucher, Y.; Yamamoto, T.R.
Source	*Diabetes Care.* 14(7, Supplement 3):695-705, July 1991.
Abstract	Using data from the University of California, San Diego (UCSD) Medical Center, which has had a Diabetes in Pregnancy Clinic since 1978, researchers describe their experience with pregnant Mexican-American women who have predominantly noninsulin dependent (type II) diabetes (NIDDM) and gestational diabetes mellitus (GDM). Patients are from a low-socioeconomic group and are referred from primary care obstetric clinics, other physicians, or the American Diabetes Association. Routine screening for GDM by a 50-gram glucose loading test given at random was performed at 24-28 weeks of gestation in all UCSD primary care obstetric clinics and satellite community clinics participating in a comprehensive perinatal project. Patients with abnormal screening and 3-hour oral glucose tolerance tests were tentatively classified as GDM during pregnancy and reclassified 6 weeks after delivery. From 1986 through 1988, 7,895 live-born infants were delivered at UCSD and 143 or 1.8 percent had mothers with diabetes. At UCSD, 66 percent of NIDDM and 51 percent of GDM patients have been of Mexican-American descent, since 1986. Mexican-American obese mothers with GDM had more frequent cesarean sections and were more likely to have complications of premature rupture of membranes and preterm labor. Polycythemia and sepsis also occurred more often among their infants. Anthropometric measurements among infants of both lean and obese mothers with GDM differed from those of infants of mothers without GDM. Infants of lean mothers with GDM were heavier and longer than those of lean mothers without GDM. In addition, they had increased waist-hip ratio and triceps and subscapular skin folds. Infants of obese mothers with GDM were heavier than infants of lean mothers with GDM. 4 figures, 7 tables, 25 references.

Obtaining Additional Information

Questions about this publication may be directed to:

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Centers for Disease Control and Prevention
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(770) 488-5016 FAX: (770) 488-5966

Demographics

001

Americans of Latin Descent.

Form: Journal article.
Author: Jewler, D.
Source: *Diabetes Forecast.* Pages 27-28, 31-32, September 1988.

Abstract: Compared with Anglos, Mexican Americans and Puerto Ricans in Puerto Rico are three to five times more likely to have noninsulin dependent diabetes (NIDDM); Cuban Americans also experience a high incidence of NIDDM. Because Latins are the fastest growing minority in the United States, and because of the high incidence of diabetes in this population, there is a significant public health problem. Not only do Mexican Americans have an increased risk of developing NIDDM, but they are also at increased risk for developing complications: Diabetes-related kidney disease requiring dialysis is about six times more common among Mexican Americans than among non-Latin whites, and retinopathy is two to three times more likely. Research in San Antonio, Texas, revealed that, compared with non-Hispanic persons with NIDDM, Mexican Americans with NIDDM had more severe hypoglycemia, were more often ill, had more severe retinopathy, and were more likely to have had a stroke. Factors in the increased incidence of NIDDM among Mexican Americans probably include obesity, distribution of body fat, and degree of Native American ancestry. Obstacles to treating NIDDM in the Hispanic population are that many Hispanics (1) cannot afford health care, (2) do not know how to use the health care system, and (3) are unable to communicate with their health care provider. Hesitancy in seeking medical care may result in delayed diagnosis and failure to keep followup appointments, follow meal plans, and take prescribed medications. Finances are a major problem; many people can not afford transportation to the health care provider or test strips for measuring blood sugar. Several factors contribute to the high incidence of obesity among Hispanic Americans: (1) Easy access to high fat junk foods, (2) a tendency to eat more fat in the United States than in Mexico, and (3) a tendency to become sedentary. Changing dietary habits is difficult, especially among low-income people who fear that the change would be expensive. Health care providers should focus on proper nutrition and exercise for an end result of weight loss and normalization of blood sugar. Early childhood education in Hispanic American communities should stress the importance of good nutrition and exercise. Early diagnosis of diabetes is a key to preventing major complications. It is important for Hispanic Americans to have regular medical checkups even before the symptoms of diabetes appear. A health-care environment that includes an open, supportive, bilingual medical team is ideal. The American Diabetes Association Task Force on Minority Initiatives is working to assist in organizing local programs and develop new Spanish-language education materials. It is distributing Spanish-language public service announcements and networking with national organizations serving Hispanic communities.

002

Family Structures in an Urban Puerto Rican Community.

Form: Journal article.
Author: Pelto, P.J.; Roman, M.; Liriano, N.
Source: *Urban Anthropology.* 11(1):39-58, Spring 1982.

Abstract: Data derived from a 1977 interview study by the Hispanic Health Council of 153 households in three lower-income Puerto Rican neighborhoods in Hartford, Connecticut, point to a considerable range of variation in household types. Researchers examine the range of variation and attempt to account for it in relation to other socioeconomic and cultural variables.

Results show that (1) approximately two out of every three households lacks any kind of employment, even part-time employment, for their members and (2) more than half of the households are single-parent families with a median household size of four. Researchers examine the consequences of the interaction between household type and employment status for mental health and general adaptability to an increasingly stressful urban environment. The data show a clear relationship between employment and dual-parent status. Compared with other family types, dual-parent, employed households tend to have relatively more children under age 5 years, have significantly more access to services at Puerto Rican agencies, and more frequently report being in debt (due to increased access to credit). Dual-parent, unemployed households have a low frequency of having a telephone, low use of services of Puerto Rican agencies, and other relatives living in Hartford. Single-parent, unemployed households show the poorest socioeconomic status, significantly less close kin in the city, less access than the dual-parent unemployed families to the services at the local Puerto Rican agencies, and fewer young children. A total of 26 percent of respondents (who were almost all women) had some contact with psychiatric services. Dual-parent, unemployed households show markedly higher levels of psychiatric problems than do the other two family types; fully half reported being referred to psychiatric services. Policy implications for programs and policies aimed at affecting and improving the situations of Puerto Rican people in contexts such as inner-city Hartford include that (1) it is very likely that the life situations and average household economics of Puerto Ricans differ substantially in different urban centers; (2) although many Puerto Rican families have a substantial number of relatives within easy social contact and rely on their networks of relatives for collaborative action to offset economic and social problems, substantial numbers of families do not have relatives and other contacts in the immediate region; and (3) single-parent households are not in any sense more effective, nor are they necessarily less effective than dual-parent households as adaptational systems for coping with the stresses of urban life. The researchers conclude that dual-parent households in which neither parent is employed are experiencing the greatest difficulties in the urban setting. 9 tables, 14 references.

003

Hispanic Americans Today.

Form: Report.
Corporate Author: US Department of Commerce, Economics and Statistics Administration, Bureau of the Census.
Source: Washington, DC, US Department of Commerce, Economics and Statistics Administration, Bureau of the Census, Current Population Reports, Population Characteristics P23-183, 46 p., (n.d.).
Availability: US Government Printing Office, Superintendent of Documents, Washington, DC 20402. (202) 783-3238.

Abstract: Hispanic American Today, a report by the Bureau of the Census, is a statistical compilation presenting data related to Hispanic Americans on population distribution and composition, family, education, language and immigration, labor force, income, poverty, hospital insurance coverage and noncash benefits, housing, business ownership, voting, elected officials, and imports and exports. Most of the data are presented at the national level. Selected data are shown for the 10 states with the largest Hispanic population in 1990, the 15 states with the largest number of Hispanic-owned firms in 1987, and characteristics for the population of Puerto Rico. Population growth, composition, and distribution figures address (1) Hispanic population growth: 1970 to 2050; (2) Hispanic population: 1970 to 2050; (3) Hispanic population, by type of origin: 1970 to 1990;

(4) Hispanic population for selected states: 1980 and 1990; (5) percent Hispanics of total population for selected states: 1980 and 1990; (6) percent Hispanics of total population, by state: 1990; (7) metropolitan-nonmetropolitan residence: 1990; and (8) Hispanic population for selected metropolitan areas: 1990. Age of the population is addressed for 1990. Information about family composition among Hispanics includes families with children: 1970 to 1990, families with own children: 1990, and families maintained by females: 1970 to 1990. Information about educational attainment among Hispanics includes (1) educational attainment: 1970 to 1992, (2) educational attainment: 1990, (3) percent Hispanic high school graduates for selected states: 1990, (4) percent Hispanic college graduates for selected states: 1990, and (5) Hispanics with graduate or professional degrees for selected states: 1990. Language and nativity figures address (1) language spoken at home: 1990; (2) foreign-born persons from Spanish-speaking Latin America: 1990; (3) legal immigration, by area of origin: 1951 to 1990; and (4) applicants for legalization under Immigration Reform and Control Act (IRCA) of 1986, by area of origin: May 1987 to May 1988. Labor force and occupation figures address unemployment rates: March 1982 to 1992, Occupations of Males: March 1992, and occupations of females: March 1992. Income and poverty status figures address (1) median earnings, by sex and educational attainment of Hispanics: 1991; (2) median income of families: 1981 to 1991; (3) median income of Hispanic households for selected states: 1989; (4) change in Hispanic median household income for selected states: 1979 to 1989; (5) Hispanic households with incomes of $50,000 or more for selected states: 1989; (6) persons below the poverty level, by age: 1991; (7) families below the poverty level: 19881 to 1991; (8) Hispanic persons below the poverty level for selected states: 1989; and (9) poverty rates of Hispanic families, by type: 1991. Health insurance coverage and program participation figures address health insurance coverage: 1985 to 1989, and participation status in programs of means-tested assistance of persons in households: 1991. Housing figures address Hispanic owner-occupied households for selected states: 1990. Business ownership figures address (1) Hispanic-owned firms: 1972 to 1987, (2) selected industry groups in receipts for Hispanic-owned firms: 1987, (3) Hispanic-owned firms for selected states: 1987, (4) receipts of Hispanic-owned firms for selected states: 1987, (5) average receipts of Hispanic-owned firms for selected states: 1987, (6) Hispanic-owned firms for selected metropolitan areas: 1987, and (7) receipts of Hispanic-owned firms for selected metropolitan areas: 1987. Voting and elected officials figures address (1) voting and registration: 1980 to 1992; (2) Hispanics who registered and voted in the election of 1992; (3) local elected officials of Hispanic origin, by type of local jurisdiction: 1987; and (4) local elected officials of Hispanic origin, by sex for selected states: 1987. Population of Puerto Rico figures address (1) Puerto Rico: Population: 1899 to 1990; (2) Puerto Rico: Children ever born: 1970 to 1990; (3) Puerto Rico: Educational attainment: 1970 to 1990; (4) Puerto Rico: Employment and unemployment: 1970 to 1990; (5) Puerto Rico: Median income: 1969 to 1989; and (6) Puerto Rico: Family poverty: 1969 to 1989. Exports and imports from Latin America figures address (1) exports to and imports from Latin America: 1991; (2) exports to selected Latin American countries: 1991; (3) imports from selected Latin American countries: 1991; and (4) balance of trade with Latin America: 1991.

004

One Voice, One Vision: Recommendations to the Surgeon General to Improve Hispanic/Latino Health.

Form: Report.
Corporate Author: Surgeon General's National Hispanic/Latino Health Initiative.
Source: Washington, DC, US Department of Health and Human Services, Office of the Surgeon General, 193 p., June 1993.
Availability: US Department of Health and Human Services, Office of the Surgeon General, 200 Independence Avenue, SW., Washington, DC 20201. (202) 690-7163.

Abstract: One Voice, One Vision: Recommendations to the Surgeon General to Improve Hispanic/Latino Health is an initiative designed to reduce health disparities and improve the delivery of health services in Hispanic American populations. Specific goals include (1) improving the collection of health data for Hispanics/Latinos, (2) developing a relevant and comprehensive research agenda for Hispanic/Latino health issues, (3) increasing Hispanic/Latino representation in the science and health professions, and (4) expanding community-based health promotion and disease prevention outreach activities for Hispanics/Latinos. Chapter one is an introduction to the initiative. Chapter two contains a charge by Antonia Novello, U.S. Surgeon General, to the participants of the 1992 Surgeon General's National Workshop on Hispanic/Latino Health. The purpose of the national workshop was to document the status of Hispanic/Latino health and to begin developing strategies to meet identified needs. Chapter three presents background papers summarizing the literature on Hispanic/Latino health status: (1) Improving Access to Health Care in Hispanic/Latino Communities, (2) Improving Data Collection Strategies, (3) Increasing Representation in the Health Professions, (4) Development of a Relevant and Comprehensive Research Agenda to Improve Hispanic/Latino Health, and (5) Health Promotion and Disease Prevention. Chapters four and five present workshop recommendations and strategies. Chapter six contains the surgeon general's closing remarks from the national workshop. Chapter seven provides a summary of postworkshop regional health meetings that were held in Chicago, Illinois; Los Angeles, California; Miami, Florida; New York City, New York; and San Antonio, Texas. The objectives of each regional health meeting were to identify and focus on the specific needs of the regions, to develop strategies for creating partnerships for action at the local and state levels, and to strengthen the linkages that already exist to promote Hispanic/Latino health and well-being. Chapter eight contains the priority recommendations developed at a postworkshop executive planning committee meeting in April 1993. The recommendations address (1) communication and representation, (2) policy, (3) resources, (4) public-private partnership, and (5) advocacy.

005

Specific Hispanics.

Form: Journal article.
Author: Winsberg, M.
Source: *American Demographics.* 16(2):44-49, 52-53, February 1994.

Abstract: A researcher examines 1990 census data on Hispanic populations in 12 urbanized areas of the United States. The U.S. Census Bureau defines urbanized areas as one or more places that together with the densely settled surrounding territory have a minimum of 50,000 persons. The study presents data on Mexican Americans and Hispanic groups from Colombia, Cuba, the Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Peru, and Puerto Rico. Among all Hispanics in the United States, the share of Mexicans has fallen from 62 percent in 1970 to 61 percent in 1990. The Puerto Rican and Cuban shares have remained at about 12 and 5 percent, respectively. Hispanic Americans who do not have origins in these three countries are a small share of the nation's total Hispanic population, but their numbers grew by slightly more than 2 million between 1970 and 1990. Six of the 12 Hispanic subgroups identified in the 1990 census have more than 80 percent of their populations in the nation's 20 largest cities, and 3 others have between 70 and 79 percent. The census also reveals many smaller areas with large and growing populations of specific Hispanics. San Antonio, Texas, and San Diego, California, have the fourth and fifth largest Mexican American communities in the nation, and Philadelphia, Pennsylvania, has the third largest Puerto Rican population. Tampa and Fort Lauderdale (Florida) have the fourth and fifth largest concentrations of Cubans, and the areas of Boston and Lawrence (Massachusetts) have the third and fourth largest Dominican groups. Perhaps the most exotic place where Mexicans congregate in large numbers is in the Bay City-Saginaw metropolitan area in Michigan. Many of the smaller Hispanic subgroups never show up on marketers' computer screens. Language barriers and the lack of large ethnic neighborhoods can make it especially hard to reach them with specially designed messages. Maps and charts present data for each of 12 Hispanic groups.

006

U.S. Hispanics: Challenging Issues for the 1990s.

Form: Report.
Author: Valdivieso, R.; Davis, C.
Source: Washington, DC, Population Reference Bureau, Inc., Population Trends and Public Policy, 16 p., 1988.
Availability: Population Reference Bureau, Inc., 777 14th Street, NW., Washington, DC 20005. (202) 639-8040.

Abstract: The number of Hispanics in the United states reached 20 million in 1988, a 34 percent increase since 1980. The growing Hispanic population presents challenges to the U.S. policymakers in nearly every area, but most urgently in education, job training, and welfare. Hispanics are highly concentrated geographically with 89 percent living in one of nine states and 55 percent living in California and Texas alone. The median age of Hispanics is 26 years compared to 32 years for the general U.S. population. Furthermore, the Hispanic birth rate is 50 percent higher than the U.S. average. By the year 2000, they will constitute at least 10 percent of the U.S. population and about 16 percent of U.S. school children and job seekers. Hispanics have been a disadvantaged minority with lower levels of education and ethnic discrimination. In 1987, the average household income for Hispanics was only two-thirds that of other Americans; 26 percent of all Latino families were below the official poverty level; and 52 percent of Latino families headed by a single woman were poor. Cuban Americans had the lowest poverty rates and the highest average household income ($27,300) of all Hispanic subgroups, while Puerto Ricans had the highest poverty rates and lowest average household income ($15,200). Most researchers agree that improving the plight of the Hispanic population must begin with the schools, since 38 percent of Latino students do not complete high school. U.S. businesses are beginning to recognize that they will be employing more Hispanics in the future, and some have instituted programs to help keep Latinos in school and promote job training. Latinos literate in both English and Spanish also provide a competitive advantage to U.S. corporations doing business in Latin America. The emergence of the Hispanic voter may shift the political priorities in some areas, and have already made Hispanics a major factor in the U.S. presidential races. The reapportionment of Congress and redrawing of congressional districts after the 1990 Census may provide a new opportunity for Hispanics to increase their political participation and influence. Presently, there is little indication that the position of U.S. Hispanics will improve, although some will continue to progress to higher socioeconomic levels. On the contrary, many international and domestic trends point to continuation of the same problems that have plagued Hispanics for the past two decades. These indicators underscore the need for policies and action, by both public and private sectors, to break the cycle of underachievement and poverty that has characterized many U.S. Hispanics. The growing recognition that the quality of our future labor force will hinge on improving the education and job skills of young Hispanics and that Hispanics wield increasingly large political clout probably offer the best incentive for American policymakers to pay attention to Hispanic concerns. 6 figures, 1 table, 17 references.

General Hispanic/Latino Health Context Issues and Considerations

Culture, cultural norms, and linguistics

007

Acculturation and Compliance With Medical Therapy.

Form: Journal article.
Author: Pachter, L.M.; Weller, S.C.
Source: *Journal of Developmental and Behavioral Pediatrics.* 14(3):163-168, June 1993.

Abstract: Researchers sought to determine whether degree of acculturation to mainland United States culture was predictive of compliance with medical therapy in Puerto Rican families that have a child with asthma. The study population consisted of the families of inner-city mainland Puerto Rican children who attended the asthma clinic at St. Christopher's Hospital for Children and who took oral theophylline as part of their medical management. Parents completed a questionnaire concerning (1) general health care; (2) asthma care; and (3) demographic, socioeconomic, and cultural issues. The study instrument included questions concerning the number of medications the child took daily to control the asthma and resistance on the part of the child to taking medicine. Researchers measured the main independent variable, acculturation, using the Bicultural Involvement Questionnaire, which addresses (1) language use in different situations, (2) television and radio preferences, (3) ways of celebrating holidays, (4) food preferences, and (5) recreational activities. At the end of the clinic visit, and after the questionnaire was completed, the child gave a blood sample to determine serum theophylline level. The outcome variable under investigation was compliance with medicine taking, as measured by the patient's serum theophylline level. Families were divided into compliant and noncompliant groups based on their child's serum theophylline determination. There was a significant difference in mean acculturation scores between compliant and noncompliant groups. Those in the compliant group had scores indicative of a style of acculturation that integrated aspects of both Anglo and Puerto Rican lifestyles. Those in the noncompliant group had scores indicative of a less acculturated lifestyle. 2 tables, 45 references.

008

Black Magic Beliefs and White Magic Practices: The Common Structure of Intimacy, Tradition, and Power.

Form: Journal article.
Author: Wanderer, J.J.; Rivera, G.
Source: *Social Science Journal.* 23(4):419-430, 1986.

Abstract: Researchers examined a system of witchcraft beliefs (black magic) and a system of health practices (white magic) for similarities in structure. They also examined white magical practices to locate the position of the curandera (folk healer) in the healing hierarchy. A review of the literature led the researchers to hypothesize three dimensions that govern the structure of white and black magic: (1) Intimacy, in which treatment modalities or agents are arranged in a social hierarchy marked by social distance from the nuclear family (e.g., from mother to grandmother to relative to neighbor to friend to curandera (folk healer)); (2) tradition, in which health practices related to white magic and beliefs related to black magic occupy separate domains along a continuum of modernity, marked by traditional views at one end and Western views at the other end; and (3) power, which orders items along a continuum of efficacy (i.e., the power to erode community morale and the power to counter that power). The curandera is viewed as a healer who has a gift from God and can dominate evil spirits. To gather information on curanderismo, researchers surveyed Mexican-American women in Brighton, Colorado, in the fall of 1981. Only Mexican-American women were selected for inclusion in the sample because they usually assume the major responsibility for health in the household. Questionnaires, which were offered in Spanish and English, were left at the respondents' household to be self-administered. The contact in each household was informed that only the woman of the house was to fill out the questionnaire. Respondents could choose to fill out the questionnaire either in English or in Spanish. Questionnaires were picked up over a period of six consecutive weekends. If respondents indicated that they were having difficulties in filling out the questionnaire, a bilingual interviewer assisted. The procedure yielded a sample of 70 women, with a mean age of 48, an average of five children, a mean of 8.8 years of schooling, and a median family income of $12,450. The questionnaires asked about health practices and witchcraft beliefs. Thirteen items related to practices and beliefs were submitted to Smallest Space Analysis (a nonmetric multidimensional technique that represents the correlations among pairs of items as physical distances in two-, three-, or more dimensional space). The three-space solution simultaneously orders 13 items (7 linked to health practices, and 6 linked to witchcraft beliefs) along three dimensions: Intimacy, tradition, and power. Analysis of the data supports the conjecture that black magic beliefs and white magic health practices share common structural arrangements linked to social distance (intimacy), cultural practices, and group integration or solidarity. 1 figure, 60 references.

009

Cultural Considerations: Developing a Nursing Care Delivery System for a Hispanic Community.

Form: Journal article.
Author: Adams, R.; Briones, E.H.; Rentfro, A.R.
Source: *Nursing Clinics of North America.* 27(1):107-117, March 1992.

Abstract: Nurses describe a nursing care delivery system that meets the health care needs of a Mexican-American population. Valley Baptist Medical Center (VBMC), serving the Rio Grande Valley (the Valley) of south Texas, serves a predominantly Mexican American community that experiences medical indigency, illiteracy, and lack of preventive health behavior. The Valley accommodates a continual flow of undocumented immigrants that are plagued with poverty, poor housing, inadequate nutrition, and little or no education. This population sustains a high incidence of chronic illnesses, such as diabetes mellitus, hypertension, and tuberculosis. Designing a care delivery system in this environment required a major strategic planning process and led to the nursing administration's development of a shared-governance model with a bedside-managed care delivery system. The VBMC shared-governance model addresses the culture of the nursing staff and their perception of the patient population's unique needs. The nursing staff's values flow into the nursing organization through a unit-based shared-governance body called the Unit Action Committee. The Unit Action Committee, which consists of a group of elected staff who represent the entire unit staff, generates participation from all staff. Each Unit Action Committee chairperson belongs to the Executive Action Committee, which facilitates communications within the entire nursing department to promote innovation. The Executive Action Committee redesigned the department's philosophy of nursing with input from all nursing staff regarding their basic values. When the culture of the nursing staff differs from that of the patient population, the nursing administrative team, or both, the process can help establish systems that are also most satisfying to the patient. The VBMC bedside-managed care system helps to satisfy the cultural needs of patients because it takes standards of care and expects the nurse to intervene assertively with creative, individualized, specific alternatives. The system uses the restorative care path, a daily tracking tool, to detail standards and to delineate patient outcomes and nursing interventions within very specific time frames. A registered nurse assesses patients, identifies variances with the standards, and intervenes to correct variances. 20 references.

010

Cultural Heterogeneity of Mexican-Americans and Its Implications for the Treatment of Diabetes Mellitus Type II.

Form: Journal article.
Author: Urdaneta, M.L.; Krehbiel, R.
Source: *Medical Anthropology.* 11(3):269-282, June 1989.

Abstract: Mexican Americans constitute the second largest and most rapidly growing ethnic minority in the United States. To the non-Mexican American, this group appears to be culturally and religiously similar; however, Mexican Americans are an extremely heterogeneous group. A report provides a brief account of their marked intragroup cultural and socioeconomic heterogeneity. There are at least four distinct populations that are collectively referred to as Mexican American in the United States. The first is a population of settled Native Americans who learned Spanish and worked on their own land but remained more Indian than Mexican or Spanish. The second group is that population of Mexican and Spanish colonists who received land grants from their governments prior to the war between Mexico and the United States, and for all practical purposes were of Spanish culture lacking much influence from either Mexico or the United States. The third group is represented by the well-to-do elite from Mexico who were exiled for political reasons. The last group is made up of laborers who immigrated seasonally at first looking for agricultural work. This group has retained linguistic and cultural ties to their country of origin. Over half of the Mexican-American population is urban and a disproportionately large number of them have semi-skilled occupations or are blue collar workers. Mexican Americans have five times the rate of type two diabetes (noninsulin diabetes mellitus (NIDDM)) compared to that of the general American population (25 percent compared to 5 percent, respectively). Health care professional treatment strategies include (1) dietary therapy for weight control and high fiber/high complex carbohydrate intake; (2) a program of specific exercise to increase physical activity; and (3) pharmacologic intervention (e.g., an oral hypoglycemic or artificial insulin). Physicians assume that treatment regimens will have therapeutic effects, but they work only if the patient agrees to undergo a severe change in lifestyle. Because of a basic lack of knowledge about the clinical model of nutrition, many Mexican-American patients fail to grasp why they should give up preferred, familiar foods for those about which they know little. Cost of treatment is of great importance to many Mexican-Americans with diabetes and when choices must be made between continuing a therapy as prescribed or using the money for food or rent, treatment is usually the loser. Management of NIDDM relies largely on behavior modifications on the part of the patient; however, the inherent difficulty of changing long-established behavior patterns is compounded for ethnic patients because the suggested changes are couched in alien cultural terms and may be incomprehensible or unacceptable to the patient. 43 references.

011

Diabetes in Hispanic Americans: Current Research and Education Programs.

Form: Report.
Corporate Author: US Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases.
Source: Bethesda, MD, US Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases, 107 p., September 27, 1993.
Availability: National Diabetes Information Clearinghouse, 1 Information Way, Bethesda, MD 20892. (301) 654-3327.

Abstract: Diabetes in Hispanic Americans: Current Research and Education Programs presents highlights of a conference held September 27, 1993 in Bethesda, Maryland, sponsored jointly by the National Diabetes Information Clearinghouse (NDIC) and the Diabetes Mellitus Interagency Coordinating Committee, programs of the National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health. The meeting addressed research and educational issues relevant to the high rate of diabetes among Hispanic Americans. Presentations included (1) the genetic epidemiology of diabetes in Mexican Americans; (2) the clinical complications of diabetes; (3) the psychosocial and cultural determinants of diabetes and its complications in Mexican Americans; (4) an industry perspective presented by a representative of the Upjohn Company, a maker of pharmaceuticals; (5) cultural issues in diabetes education among Hispanics; (6) Hispanic health initiatives of the Chicago (Illinois) Diabetes and Research Training Center; (7) nutrition education for migrant workers; (8) an adult diabetes education program; (9) the Santa Clara Valley (California) Diabetes Program; (10) the American Association of Diabetes Educators Minority Initiative; and (11) the American Diabetes Association Hispanic Initiative: DAR (Diabetes Assistance and Resources). An appendix lists diabetes educational materials that are available in Spanish.

012

Effect of Cultural Beliefs on the Treatment of Native Peoples With Diabetes and Visual Impairment.

Form: Journal article.
Author: Ponchillia, S.V.
Source: *Journal of Visual Impairment and Blindness.* 87(9):333-335, November 1993.

Abstract: Due to the adoption of Western diets and lifestyles, an increase in the incidence of diabetes among Native Americans, Mexican Americans, and Pacific Islanders is leading to a modern epidemic of diabetes and its complications. Traditional cultural beliefs can affect the success of services to native peoples who are experiencing vision loss. A health educator discusses these cultural beliefs, with illustrations from Native American culture, and the implications for the provision of services. In native cultures, the recurring theme of life and health is the circle. One is born into a circle of family and community that supports one and that one, in turn, supports. Another way to view this circle is as a large extended family in which events that occur to one person affect the group, and vice versa. The traditional method of providing services to an individual who has lost his or her vision may fall short of the success that could be achieved by involving all concerned parties. The most successful services may be those provided in the home community with the knowledge and assistance of indigenous community health representatives, who can be sources of referrals, communicate with and teach the clients, and, if necessary, interpret for them. A Native American client may expect an ophthalmologist or low vision specialist to provide the cure for vision loss, despite explanations to the contrary. The lack of positive results could lead to a rejection of future treatments from that person. Preventive medicine, such as following a diet, taking medication when one feels well, and monitoring blood glucose, does not have a place in traditional medicine and may need to be explained with concrete examples rather than with technical explanations. A table presents other cultural values and their potential implications for service providers. 1 table, 16 references.

013

Effects of Acculturation and Socioeconomic Status on Obesity and Diabetes in Mexican Americans: The San Antonio Heart Study.

Form: Journal article.
Author: Hazuda, H.P.; Haffner, S.M.; Stern, M.P.; Eifler, C.W.
Source: *American Journal of Epidemiology.* 128(6):1289-1301, December 1988.

Abstract: Researchers hypothesized that increased socioeconomic status and acculturation of Mexican Americans to mainstream United States society would be accompanied by a progressive lessening of obesity and noninsulin dependent diabetes mellitus (NIDDM). They tested the hypothesis from 1979-1982 in the San Antonio Heart Study, a population-based study of 1,288 Mexican Americans and 929 non-Hispanic whites, aged 25-64 years, randomly selected from three San Antonio neighborhoods: (1) A low-income barrio, (2) a middle-income transitional neighborhood, and (3) a high-income suburb. Researchers used body mass index (BMI) as a measure of obesity. After diagnosing persons with diabetes, researchers identified 13 insulin takers whom they considered to have NIDDM on the basis of age at onset (over age 40) and/or obesity. Researchers measured socioeconomic status using the Duncan Socioeconomic Index, a global measure of socioeconomic status based on occupational prestige. For married participants, the socioeconomic status scores assigned were either their own or their spouse's, whichever was higher. Researchers developed scales to measure three dimensions of adult acculturation: (1) Functional integration with mainstream society, (2) value placed on preserving Mexican cultural origin, and (3) attitude toward traditional family structure and sex-role organization. Interscale correlations between ranking of Duncan Socioeconomic Index quartiles and strata of the three adult acculturation scales were calculated by the Kendall's coefficient tau. Analyses were performed separately for men and women by means of either analysis of covariance for continuous variables or multiple logistic regression for dichotomous variables. A two-tailed t-test for adjusted group means was used to compute the ethnic contrasts in BMI, glucose intolerance, and diabetes prevalence. The relations between sociocultural status and obesity and diabetes were tested by a two-tailed t-test for presence of a linear component or trend in adjusted group means. Among Mexican American men, increased acculturation was accompanied by a statistically significant, linear decline in both obesity and diabetes, while socioeconomic status had no significant effect on either outcome. Among Mexican American women, on the other hand, both increased acculturation and socioeconomic status were accompanied by statistically significant, linear declines in both outcomes. However, the effects of acculturation on obesity and diabetes prevalence in women were stronger than the effects of socioeconomic status. In women, obesity also appeared as a more important mediator of the relationship between socioeconomic status and diabetes than of the relationship between acculturation and diabetes. Findings suggest that cultural factors have a more pervasive influence on obesity and diabetes among Mexican Americans than do socioeconomic factors. 5 tables, 50 references.

014

Effects of Social Structure and Culture on Reported Health.

Form: Journal article.
Author: Angel, R.; Cleary, P.D.
Source: *Social Science Quarterly.* 65(3):814-828, September 1984.

Abstract: Researchers examined the differential impact of social structure and cultural factors on self-reported health among individuals of Mexican origin and non-Hispanics in the United States. Researchers hypothesized that (1) culture strongly influences one's sensitivity to symptoms, one's interpretation of their severity and significance, and the actions one takes in response to illness and (2) greater Mexican cultural identification leads to lower reports of ill health on certain measures. Researchers (1) reviewed the data on the morbidity and mortality of the Mexican-origin population to establish that, as a group, individuals of Mexican origin are unlikely to have better health than non-Hispanics; (2) examined patterns of self-reported health using measures to determine their consistency for Mexican-origin individuals and non-Hispanics; and (3) used a composite measure of health and control for demographic and economic factors that historically have been associated with health status (e.g., age, marital status, family size, sex, education, and family income). The analysis is based upon the most recent of a series of medical care utilization surveys conducted by the Center for Health Administration Studies and the National Opinion Research Center of the University of Chicago (Illinois). Researchers interviewed one adult and one child in each of 4,025 households with the goal of isolating indicators of social class and cultural assimilation; the sample represents the total noninstitutionalized population of the United States. The degree of cultural assimilation within the Mexican origin population was measured by the language in which the interview was conducted; individuals who took the interview totally or partially in Spanish were assumed to be less culturally assimilated than those who took the interview in English. Respondents were asked (1) whether their health was, in general, excellent, good, fair, or poor; (2) whether during the previous year their health had caused a great deal of worry, some worry, hardly any worry, or no worry at all; and (3) how many days during all of the previous year they had been kept in bed or away from their usual activities as the result of injury or illness. Being shown a list of 20 common symptoms, respondents were asked if, during the previous year, they had experienced any of them. The 20 symptoms employed in the analysis included (1) cough, (2) weakness, (3) tired in the mornings, (4) tired for weeks, (5) headaches, (6) rash, (7) diarrhea, (8) shortness of breath, (9) aching joints, (10) pain or swelling in the joints, (11) backaches, (12) weight loss, (13) heart pain, (14) indigestion, (15) vomiting, (16) sore throat, (17) sneezing, (18) bleeding, (19) pains in the gut, and (20) infected eyes or ears. Regression analyses revealed that, after controlling for economic and demographic factors, respondents with high Mexican cultural identification reported much less worry about their health, significantly less pain, fewer symptoms of illness, and fewer disability days than non-Hispanic whites, African Americans, and individuals of Mexican origin who responded to the interview in English. 4 tables, 36 references.

015

Empirical Scale to Measure Type and Degree of Acculturation in Mexican-American Adolescents and Adults.

Form: Journal article.
Author: Mendoza, R.H.
Source: *Journal of Cross-Cultural Psychology.* 20(4):372-385, December 1989.

Abstract: Researchers describe the development, modification, and validation of the

Cultural Life Style Inventory, a self-report measure. This instrument assesses the type and degree of acculturation in Mexican-American adolescents and adults. Researchers used four systematic steps to complete the item construction and test the content validity of the inventory. In the first step, a sample of five Mexican-American and four Anglo professionals who were familiar with the cultures of both ethnic groups were asked to generate separate lists of cultural customs and practices on which Anglos and Mexicans or Mexican Americans differ. In the second step, the most commonly listed cultural practices were included in a pilot inventory that contained questions and discrete multiple-option responses. Third, researchers briefed a second group of two Anglo and two Mexican-American judges on the theory and measurement of acculturation and asked them to rate the degree to which each of the items on the pilot inventory measured and sampled the dimensions of the construct of acculturation. From this rating, a revised inventory consisting of 83 items that had the highest mean ratings from the third phase was developed and empirically tested for item discrimination. Researchers designed the inventory to measure and describe the process of acculturation from three distinct perspectives: (1) The independent estimates of cultural resistance (CR), cultural incorporation (CI), and cultural shift (CS) can be obtained by computing the proportion of items on the scale that are answered in a CR, CI, or CS fashion; (2) dominant or nondominant cultural lifestyle tendencies can be determined by comparing the difference between CR, CI, and CS scores for statistical significance; and (3) a cultural lifestyle matrix can be obtained by identifying the most frequent cultural lifestyle tendency within each of the five extracted dimensions of the inventory. 4 tables, 17 references.

016

Ethnic Migration, Assimilation, and Consumption.

Form: Journal article.
Author: Wallendorf, M.; Reilly, M.D.
Source: *Journal of Consumer Research.* 10(3):292-302, December 1983.

Abstract: Researchers assessed the cultural assimilation of Mexican Americans in the southwest by comparing their food consumption patterns with those of income-matched Anglos living in the same region and those of income-matched Mexicans living in Mexico City. A sample of Mexicans living in Mexico was included to assess the basic direction of Mexican culture as enacted by Mexicans of comparable income. Studies that investigate only the behavior patterns of Anglos and Mexican Americans cannot address the process of assimilation or the impact of Mexican culture because they contain no comparison base. Seven types of foods with normative connections to cultural style were chosen for the study. All have strong norms connected with them in American culture and different norms connected with them in Mexico. Thus, the food types act as categories that show changes during the assimilation process. The food types included (1) meats, (2) breads, (3) cereals, (4) caffeine products, (5) soft drinks, (6) alcoholic beverages, and (7) convenience foods. Rather than relying on self-report data as indicators of consumption patterns, the study used data concerning the contents of the garbage produced by the households. Three samples of garbage were used. The first sample was collected in the Federal District of Mexico under the auspices of the Mexican equivalent of the National Science Foundation in the United States. A total of 217 garbage samples were included in the Mexican sample. The data on Anglo and Mexican-American consumers were drawn from the Tucson, Arizona, database established by the ongoing activities of Le Project du Garbage. The

Mexican-American sample consisted of 102 refuse observations and the Anglo sample of 97 observations. The analysis procedure used was one-way ANOVA, comparing mean levels of consumption for all three sampling groups. Results showed that, compared with Mexicans and Anglos, Mexican Americans eat more red meat and poultry, white bread, prepared tortillas, high-sugar dry cereals, caffeine products, nondietetic soft drinks, packaged pastries, and convenience and take-out foods in general. Pastries and fruit or vegetable juices are the only product categories for which differences between Mexican Americans and Anglos appear to be traceable to differences in household size and composition. The results suggest that Mexican-American consumption patterns are not a simple blending of Mexican and Anglo patterns; the patterns appear to lie in the direction of stereotypical Anglo patterns of consumption prior to increased and widespread concern about serum cholesterol levels, calories, cavities, high sugar intake, fiber intake, and caffeine consumption. 2 tables, 56 references.

017

Health Care Utilization, Family Context, and Adaptation Among Immigrants to the United States.

Form: Journal article.
Author: Leclere, F.B.; Jensen, L.; Biddlecom, A.E.
Source: *Journal of Health and Social Behavior.* 35(4):370-384, December 1994.

Abstract: Researchers used the 1990 National Health Interview Survey supplement on Family Resources to examine the health care utilization patterns of immigrant and native-born adults in the United States. The 1990 National Health Interview Survey supplement on Family Resources is a household-level survey that includes information on the health, health care use, and demographic characteristics of a nationally representative sample of the civilian noninstitutional population. They modified a standard health care utilization framework by including duration of residence in the United States and measures of immigrant adaptation and family health context to model both the probability and number of physician contacts in the previous year. Overall, recent immigrants are more likely to be living with nonrelatives or other family members and are younger, poorer, and less likely to be insured by an employer or at all, compared to the native-born adults. Results showed that the variables with the most impact on the number of visits include sex, health, receipt of health insurance, receipt of Medicare, and immigration status. Duration of residence had a strong effect. Recently arrived immigrants had fewer contacts than did either native-born or longer-term immigrant adults. The most recent immigrants, those who have been in the United States less than 5 years, are almost as disadvantaged in their access to health care as the uninsured. Persons not proficient in English had almost 1 fewer visit per year than did those interviewed in English. Once the measures of adaptation (e.g., age at immigration and language of survey interview) were included, immigrants who have been in the United States for 10 years or more are not statistically different from the native-born. Family characteristics, including measures of exposure to the formal health care system, slightly reduce the size of the effects but do not alter the basic relationship between duration of residence and health care utilization. Results suggest that, net of socioeconomic characteristics, access to health insurance, and differences in morbidity, recent immigrants are much less likely than both the native-born and those immigrants of longer duration to receive timely health care. 4 tables, 64 references.

018

Hispanic Cultural Influences on Medical Practice.

Form: Journal article.
Author: Poma, P.A.
Source: *Journal of the National Medical Association.* 75(10):941-946, October 1983.

Abstract: Hispanics share characteristics that may interfere with their search for medical help, the diagnoses of their illnesses, their therapy, and health education. A physician presents a summary of the ethnic background, beliefs, and approaches to health common among Hispanic patients. Although nonverbal communication is an important part of the patient-health worker relationship, expertise in the patient's language is a great asset. Most patients are very grateful for efforts to communicate with them in their first language. The use of mental health facilities, for example, improves when bilingual and bicultural personnel are available. The language people use as children continues to be the language they use with family and friends, the language they use under stress, and the language they identify with happy situations. In emotional situations such as those involving their health, they can communicate much more easily with someone who understands their first language. Some Hispanic persons believe that there are some diseases that can be handled only by a folk healer with certain specific rituals. This type of person tends to believe that physicians and their medicines would only do further harm. Although some Hispanics may return to healers and other alternatives when not satisfied with modern medical care, others employ both methods at the same time. Among Hispanic families, the father or husband usually makes final decisions, including those about health matters. As with other patients, the family must be involved in decision making in order to improve patients' compliance. Among Hispanics, the preferred patient-physician relationship is of the authoritarian-paternalistic type. The presentation of alternatives for treatment, although required by law and common sense, may be considered evidence of weakness by Hispanic patients, as well as an indication of a physician's poor knowledge and poor performance. 5 references.

019

Hispanic Folk Medicine Utilization in Urban Colorado.

Form: Journal article.
Author: Rivera, G.
Source: *Sociology and Social Research.* 72(4):237-241, July 1988.

Abstract: Among Hispanics, a researcher distinguishes between suffering from folk illnesses and seeking treatment for these illnesses from folk healers (i.e., curanderos). When folk illnesses appear within a member of a Hispanic family, the mother is one of the first curers to prepare home remedies for the person who has become ill. Thereafter, a sequence of consultations are pursued in an order involving a grandmother, an experienced neighbor, a village healer, a town or city healer, and a regional or international healer. Since Hispanic women are known to be the first source of healing for folk illnesses, only Hispanic women with children were included in the study. Researchers used a modified multistage cluster sampling procedure to select 128 Hispanic mothers who were born in the United States and resided in two barrios on the outskirts of Denver, Colorado. Respondents' median age was 45 years, and they had lived in their neighborhoods for a mean of 26 years. Approximately 75 percent of the women were married, 13 percent were widowed, 10 percent were divorced, and 2 percent had never married. Approximately 42 percent reported being currently employed. The sample had a median of 10 years of education and a median family income of $13,000. A bilingual interviewer delivered questionnaires to each household; a research assistant returned later to collect the completed, self-administered questionnaires. Although 43.5 percent of Hispanic women reported that they came from a family where some member had been treated by a folk healer, only 23 percent reported having undergone such treatment themselves. Eighteen percent reported that their child had been treated by a folk healer, 14.2 percent reported that a daughter or daughters had received treatment by a folk healer, and 13.4 percent indicated that they had a son or sons who had been treated by a folk healer. Tables present prevalence of eight specific folk illnesses: (1) Bilis, an illness in which anger or fear causes excessive bile in a person's system; (2) impeach, a illness caused by food sticking to the lining of the stomach; (3) embrujamiento, an illness caused by witchcraft and usually involving severe symptoms; (4) envidia, an illness caused by the envy of another person; (5) mal aire, an illness caused by evil air or wind; (6) mal ojo, an illness known as the evil eye and caused by strong vision; (7) susto, an illness known as magical fright and caused by an apparition or a frightening event; and (8) tirisia, an illness caused by depression or a disruption of one's routine. 3 tables, 28 references.

020

Mexican-American Mothers' Socialization Strategies: Effects of Education, Acculturation, and Health Locus of Control.

Form: Journal article.
Author: Cousins, J.H.; Power, T.G.; Olvera-Ezzell, N.
Source: *Journal of Experimental Child Psychology.* 55(2):258-276, April 1993.

Abstract: To identify the socialization strategies used by low-income Mexican-American mothers to promote good nutrition and eating habits in their children, researchers examined maternal education, acculturation, and health locus of control beliefs in relation to parenting strategies that promote the internalization of healthy eating habits in Mexican-American children. Participants included 80 low-income Mexican-American mothers and their children aged 4-8 years residing in a predominately Mexican-American neighborhood in Houston, Texas. The mothers were participants in El Bienestar del Nino, a larger study of the socialization of health beliefs and behaviors in Mexican-American families. All mothers were married and had at least one child aged 4-8 years; the majority of families had 3 or 4 children. The mothers were predominantly first-generation immigrants with low levels of formal education. Each family received $40 for their participation in the study. Researchers collected data in three sessions. After mothers agreed to participate in the study, they were visited in their homes by two bilingual, Hispanic research assistants for an introductory session. The researchers (1) obtained information about participants' education, occupation, income, and medical history and (2) administered acculturation and assimilation scales. Four months after the introductory session, a team of two bilingual research assistants revisited the homes for an observation session that lasted from dinner time to the target child's bedtime. After a brief introduction, family members were instructed to do what they usually do during that time of day and to act as if the observers were not present. At the end of dinner, researchers interviewed mothers about their housekeeping and childrearing practices. The Eating Habits Socialization Interview was included in these assessments. Results indicated that education did not predict maternal behavior after controlling for health locus of control beliefs. 5 tables, 36 references.

021

Traditional Mexican American Medicine and Hospital Practice.

Form: Journal article.
Author: Lusk, M.W.
Source: *Arete.* 11(2):1-14, Winter 1986.

Abstract: A researcher explores the basis of traditional Mexican-American medicine and discusses implications for hospital practice, with particular reference to social work. The discussion is based on an analysis of the literature on Mexican-American health beliefs and behaviors, clinical experience with Mexican-American patients in hospital settings, and formal study of curanderismo (Hispanic folk medical practice) in Morelos, Mexico. Mexican Americans as a group have higher mortality rates and lower life expectancy than the general population, with diabetes, tuberculosis, and accidents being more frequent causes of mortality for Mexican Americans than for other ethnic groups. As a group, Mexican Americans have a significantly lower socioeconomic status than the national mean and incur many poverty-related diseases linked to substandard diet, overcrowding, poor housing, unpurified water, and inadequate prenatal care. Access to medical care is not available to all Mexican Americans. Traditional medicine is much less expensive and more personal. Another reason for the continued use of traditional medicine is the belief that certain folk disorders are unique to Mexican Americans and cannot be treated by biomedical practitioners. Three culture-bound illnesses are presented: (1) Caida de la mollera, (2) mal ojo, and (3) susto. When an infant is restless, feverish, and breast feeds erratically, the symptoms may be attributed to caida de la mollera, or fallen fontanel. Curanderismo believes the syndrome to be linked to a displacement of the soft plate of the infant's cranium, usually as a consequence of a fall or a blow to the head. Mal ojo or evil eye is the physical imbalance that results from being exposed to covetous or powerful glances by stronger individuals. Women and children are considered more susceptible than men to this illness. The syndrome is manifested as severe headache, fever, restlessness, and in children, inconsolable weeping. Exposure to a mortifying sight, an abrupt shock, or a dreadful episode is believed to result in some instances in susto or fright, which is manifested as listlessness, anorexia, and depression. Underlying such folk disorders is a practical and theoretical system of health that supports cultural norms as well as physical and psychological health. The system incorporates elements of the Spanish tradition with its emphasis on Hippocratic humoral theory and the Native American tradition with its focus on spiritual harmony and personal integrity. Fundamental to the effective practice of medicine in a cross-cultural context is the realization that the western biomedical model cannot fully account for lay or folk perspective on sickness episodes. Folk medicine emphasizes the psychosocial and religious dimensions of health care and reaffirms cultural values and identity. Because western medical practice tends toward ethnocentrism and scientism, the bias of health care professionals has been to replace traditional care with professional care. Traditional science is pluralistic; practitioners of folk medicine make regular referrals to western physicians for serious illness and themselves utilize such services. A formal linkage between the biomedical and folk sectors in the hospital setting could be useful in helping to identify competing and possibly harmful medical interventions. It is suggested that, in areas serving large numbers of traditional Mexican Americans, curanderos should be retained as consultants to (1) advise regarding folk procedures used in the community, (2) provide a referral system so that scientific care can be rendered earlier in the illness episode, and (3) permit ethnic care for the patient's psychosocial and religious needs under medical supervision. 70 references.

See also 001, 006

General Hispanic/Latino Health Context Issues and Considerations

Socioeconomics

022

Determinants of Regular Source of Health Care in Black, Mexican, Puerto Rican, and Non-Hispanic White Populations.

Form: Journal article.
Author: Lewin-Epstein, N.
Source: *Medical Care.* 29(6):543-557, June 1991.

Abstract: Researchers examined the determinants of regular source of health care using a sample of African Americans, Mexicans, Puerto Ricans, and non-Hispanic whites residing in poverty areas of Chicago, Illinois. Data were collected by the NORC Social Science Research Center at the University of Chicago during 1987 as part of the Urban Family Life Survey (UFLS). The sample included 1,184 African Americans, 488 Mexicans, 452 Puerto Ricans, and 365 non-Hispanic whites. Specially trained interviewers conducted door-to-door interviews. Social isolation was measured through contact (i.e., the extent to which persons are tied to their local neighborhoods); passive and active social participation; and networks (i.e., the size of networks to which one can turn for ordinary needs and in times of crisis). Demographic variables included age, sex, and education. The dependent variable was the respondents' regular source of health care (e.g., private physicians, hospital outpatient departments (including emergency rooms), neighborhood clinics, and none). Over 25 percent of the respondents had no regular source of health care. Although Mexicans appeared to be the least likely to have a regular source of health care (29.5 percent reported no regular source of health care), whereas Puerto Ricans and whites were the most likely to have some regular source of care, the differences were not statistically significant. Approximately 30 percent of respondents mentioned a private physician, 23 percent mentioned hospital outpatient departments (26.5 percent of these respondents were African American), 4 percent mentioned hospital emergency rooms (4.9 percent of African Americans), and 17 percent mentioned neighborhood clinics (19 percent of African Americans). African Americans were the only group more likely to turn to a hospital rather than to a private physician for regular health care. Results showed that economic resources (in the form of health insurance), extent of social isolation, and ethnic group membership had independent effects on the source of regular health care. Use of public health insurance appeared to encourage use of hospital facilities rather than private physicians as a regular source of care. Also, public health insurance as opposed to private health insurance (i.e., the limited coverage health insurance usually available in a low income population) increased the likelihood of having a regular source of care. Greater social participation and more extensive networks reduced the likelihood of having no regular source of care.

023

Effect of Socioeconomic Status on Hyperglycemia and Retinopathy Levels in Mexican Americans With NIDDM.

Form: Journal article.
Author: Haffner, S.M.; Hazuda, H.P.; Stern, M.P.; Patterson, J.K.; Van Heuven, W.; Fong, D.
Source: *Diabetes Care.* 12(2):128-134, February 1989.

Abstract: Researchers examined the relationship between socioeconomic status and both the level of hyperglycemia and severity of retinopathy in participants from the San Antonio Heart Study. In phase I of the San Antonio study, researchers identified 191 persons with noninsulin dependent diabetes mellitus (NIDDM). In phase II, researchers identified 231 persons with NIDDM. Diabetes was diagnosed according to the criteria of the National Diabetes Data Group (NDDG). These 422 persons, including 343 Mexican Americans and 79 non-Hispanic whites, formed the basis of the present study. Researchers recontacted persons with diabetes from both phases and asked them to participate in a diabetes complications assessment. Researchers assessed socioeconomic status using (1) Duncan's socioeconomic index (a global measure of socioeconomic status based on occupational prestige); (2) educational attainment (less than high school diploma, high school diploma, and at least some college or beyond); and (3) income. Anthropometric measurements included height, weight, and body mass index (BMI). Researchers assessed hyperglycemia as the sum of fasting, 1-hour, and 2-hour plasma glucose concentrations during a standard oral glucose tolerance test. A retinal specialist performed funduscopic examination of the retina with both direct and indirect ophthalmoscopy after dilation of the pupil. Analyses in this study are based on seven stereoscopic fundus photographs of each eye obtained by certified photographers with procedures adapted from the Early Treatment of Diabetic Retinopathy Study. Researchers defined retinopathy as background, preproliferative, or proliferative. The distribution of retinopathy in the 257 Mexican Americans was none, 55 percent; background, 20 percent; preproliferative, 19 percent; and proliferative, 6 percent. Socioeconomic status (SES) was assessed with the Duncan Socioeconomic Status Index. Age-adjusted means for the clinical and socioeconomic characteristics of people with diabetes were calculated by two-way analyses of covariance with ethnic group and sex as the grouping variables. The effect of SES on fasting glucose and glucose serum was assessed by multiple linear regression with age, sex, and SES as the independent variables. Contrary to expectations, low socioeconomic status was not associated with greater levels of hyperglycemia or grades of retinopathy. 4 tables, 35 references.

024

Insuring Latinos Against the Costs of Illness.

Form: Journal article.
Author: Valdez, R.B.; Morgenstern, H.; Brown, E.R.; Wyn, R.; Wang, C.; Cumberland, W.
Source: *Journal of the American Medical Association (JAMA).* 269(7):889-894, February 17, 1993.

Abstract: Researchers examined the determinants of health insurance coverage for Latinos in the United States and how different targeted strategies for health care reform differentially affect the nation's major ethnic groups, focusing on the implications for the Latino population. Using data from the 1980 and 1990 Current Population Surveys, researchers compared the insurance status of nonelderly (less than age 65 years) Latinos with non-Hispanic whites, African Americans, and Asians by estimating the attributable fraction for selected covariates including age, sex, education, family income, family size, employment status, type of industry, type of occupation, employer firm size, insurable unit size and type, and state of residence. The effects of health care reform strategies on the coverage of the major ethnic groups were simulated from these data. The researchers examined the following general strategies representing a broad range of approaches: (1) Provide coverage for all poor individuals, (2) provide coverage for all minors, (3) provide coverage for all full-time workers, (4) provide coverage for all full-time workers and their children, (5) provide coverage for full-time and part-time workers, (6) provide coverage for full-time and part-time workers and their children, and (7) provide coverage for all poor individuals and all full-time workers. The main outcome measures consisted of percentage uninsured, percentage insured by Medicaid, and the attributable fraction for the covariates. To understand what factors contributed to the difference in health insurance coverage between Latinos and non-Hispanic whites, researchers applied a stratified analysis and expressed the unadjusted association between ethnicity and lack of insurance coverage as the crude relative risk. To quantify how much of the difference in insurance coverage between Latinos and non-Hispanic whites is explained by ethnic differences, the attributable fraction for covariates (AFC) was calculated. Results indicate that Latinos have the worst health insurance coverage of any ethnic group in the nation. Approximately 39 percent of Latinos are uninsured, compared with 13.8 percent for the non-Hispanic white and 24 percent for the African American populations. Providing coverage to all the poor could reduce the uninsured rate for non-Hispanic whites by approximately 23 percent, whereas the reduction among Latinos could be approximately 37 percent and approximately 42 percent among African Americans. Similar reductions could be achieved by covering all workers and their minor dependents. Regardless of the approach to reform, however, Latinos' high absolute rates of uninsurance would remain. The researchers concluded that differences in Medicaid eligibility, labor force characteristics, and family composition between Latinos and other ethnic groups suggest that policy initiatives may affect Latinos differently. Targeted strategies such as employer mandates, pay or play programs, or Medicaid expansions can improve coverage, but many Latinos could still remain uninsured. 5 tables, 21 references.

See also 001, 006

General Hispanic/Latino Health Context Issues and Considerations

Education

See 001, 006, 020

General Hispanic/Latino Health Context Issues and Considerations

Religion (role of)

025

Perceptions of the Importance Placed on Religion and Folk Medicine by Non-Mexican-American Hispanic Adults With Diabetes.

Form: Journal article.
Author: Zaldivar, A.; Smolowitz, J.
Source: *Diabetes Educator.* 20(4):303-306, July-August 1994.

Abstract: Researchers in New York City examined whether religious, spiritual, and folk medicine beliefs play a role in the participants' view of diabetes and treatment choices in Hispanic populations. Participants were recruited from among a convenience sample of non-Mexican Hispanic adult patients receiving treatment for diabetes in the medical clinic, medical subspecialty clinics, or Diabetes Education Program at an inner-city hospital outpatient department. A total of 104 Hispanic adults with diabetes completed a questionnaire written in both English and Spanish that addressed patient demographics and spiritual and folk medicine beliefs. A total of 37 males and 67 females, ages 25 to 82 years, completed the questionnaire. Duration of diabetes ranged from 2 months to 32 years. Forty-seven percent of patients were using insulin in the management of their diabetes. Participants reported that they had lived in the United States from 2 to 76 years; 43 percent were born in the Dominican Republic, 35 percent in Puerto Rico, 8 percent in Cuba, 8 percent in Ecuador, 4 percent in New York City, and 2 percent in Honduras. Mean level of education was fifth grade. Participants understood the potential long-term complications of diabetes mellitus, with 78 percent believing they could die from diabetes and 59 percent believing they will die from diabetes. Participants indicated that religious beliefs play an important role in their diabetes care; 78 percent said that they have diabetes because it was God's will and 28 percent believed that having diabetes was a punishment from God. Participants reported believing in certain common folktales as they related to the cause of diabetes; 61 percent believed that they had diabetes because they ate too many sweets as a child. Most participants did not use herbs or folk medicine to treat their diabetes. Many participants responded that religious beliefs played a role in the treatment of their diabetes; 55 percent stated that their priests helped them control their diabetes and 9 percent stated that their spiritualist helped them control their diabetes. 2 tables, 9 references.

026

Religious Attendance and Subjective Health.

Form: Journal article.
Author: Levin, J.S.; Markides, K.S.
Source: *Journal for the Scientific Study of Religion.* 25(1):31-40, March 1986.

Abstract: Researchers studied religious attendance and subjective health using a three-generation sample of Mexican-American Catholics in the San Antonio (Texas) SMSA during 1981-1982. A total of 1,125 people were interviewed, 375 from each generation. Area probability sampling was employed to select older Mexican Americans aged 65-80 years with three-generationally linked families in the San Antonio area. Information was subsequently obtained on their children and adult married or ever-married grandchildren. Three-generation lineages including an older person, a middle-aged child, and a grandchild were selected randomly. Approximately two-thirds of the sample were women. The independent variable, frequency of religious attendance, was measured by asking respondents how frequently they attend religious services. The dependent variable, self-rated or subjective health, was measured by asking respondents to rate their health as excellent, good, fair, or poor. The study controlled for (1) social support, (2) physical capacity, (3) social class, and (4) subjective religiosity. To test for the effect of social support, researchers controlled for the number of secular organizational memberships. To test physical capacity, they controlled for activity limitation due to health problems. Among both older and younger women, significant zero-order associations are explained away by removing the effects of physical capacity. These findings lend empirical support to theoretical work in social gerontology suggesting that religious attendance may represent a proxy for functional health, especially in older people. 2 tables, 39 references.

See also 001, 006

General Hispanic/Latino Health Context Issues and Considerations

Age

027

Health Status of Hispanic Elders.

Form: Journal article.
Author: Bassford, T.L.
Source: *Clinics in Geriatric Medicine.* 11(1):25-38, February 1995.

Abstract: A researcher discusses the health status of Hispanic Americans over 64 years of age. Data came from the Hispanic Health and Nutrition Survey (HHANES), the 1980 National Health Interview Survey (NHIS), the 1970 National Health and Nutrition Examination Survey (NHANES), and the Surveillance, Epidemiology, and End Results (SEER) Program of the National Cancer Institute. The term Hispanic refers to a diverse group of people, comprised of many different groups, each with somewhat different values, traditions, and health concerns. In the Hispanic American population aged 65 years and older, the highest proportion are Mexican Americans, followed by Puerto Ricans and Cuban Americans. Compared with the population as a whole, Hispanic Americans are least likely to have health insurance. In the population over age 65 years, 38 percent of Mexican Americans, 16 percent of Puerto Ricans, and 24 percent of Cuban Americans do not have health insurance. The top two causes of death in the older Hispanic American population are heart disease and malignant neoplasms. Cerebrovascular disease, chronic obstructive pulmonary disease, chronic liver disease and cirrhosis, pneumonia, and accidental death also contribute significantly to mortality rates in older Hispanic populations. The older Hispanic population has an excess prevalence of diabetes when compared to other United States populations. Noninsulin dependent diabetes mellitus accounts for the majority of the excess prevalence of diabetes in the older Hispanic population. Twenty-six percent of Puerto Ricans and 24 percent of Mexican Americans were found to have diabetes in the HHANES study. The prevalence of undiagnosed diabetes was higher among all Hispanic groups than among the national population. Mexican Americans were especially undertreated; 40 percent of those with diabetes were receiving no diabetes treatment. Although obese Hispanics are more likely to have diabetes than other Hispanics, the prevalence remains greater even when data are controlled for obesity. A study of Mexican-American persons with diabetes in San Antonio, Texas, found that hyperinsulinemia is greater in Mexican-American persons with diabetes per degree of central obesity than in whites who are not Hispanic. The natural history of the disease also appears to differ. Mexican Americans with diabetes have six times the rate of end-stage renal disease requiring dialysis and three times the rate of retinopathy as their counterparts who are not Hispanic. Some of the difference is probably a result of poorer control of the disease in the Hispanic population; however, an association between Pima-Indian ancestry and prevalence of diabetes suggests the possibility of a genetic component. 64 references.

028

Hispanic Elders in Texas: Implications for Health Care.

Form: Journal article.
Author: Espino, D.V.; Moreno, C.A.; Talamantes, M.
Source: *Texas Medicine.* 89(10):58-61, October 1993.

Abstract: Researchers discuss factors affecting the health of elderly Hispanic persons in Texas and provide for health practitioners a list of issues that may affect the care of older Hispanic patients. The male to female ratio of Hispanic elderly at age 65 years is 86 to 100, respectively. Hispanic elders are more likely to live in poverty than are non-Hispanic whites, and more than 50 percent are functionally illiterate in English (approximately 88 percent are also illiterate in Spanish). Ninety-one percent of elderly Hispanics, 96 percent of elderly whites, and 95 percent of elderly African Americans receive Medicare benefits. The leading causes of death among Hispanic over age 65 years are heart disease and cancer. Hispanic Americans over age 75 years die more often of complications from diabetes mellitus than do non-Hispanic whites, but Hispanic Americans tend to die less often from complications related to chronic obstructive pulmonary disease. The primary chronic health conditions that affect the elder Hispanic population include noninsulin dependent diabetes mellitus (NIDDM), heart disease, and neoplasms. NIDDM affects approximately 21.6 percent of older Hispanic Americans in the southwestern United States as compared to 9.8 percent of the general population. Genetic predisposition appears to provide the most compelling explanation, although environmental factors may override genetic susceptibility in the expression of the disease. Elderly Hispanics have rates similar to or lower than those for non-Hispanic whites in the same age group for heart disease. This ethnic advantage may result from positive risk factor profiles such as lower serum cholesterol, lower rates of smoking, and lower rates of alcohol use. State-level data for New Mexico and Texas indicate that the incidence of neoplasms is also consistently lower in Hispanics than in non-Hispanic whites and African Americans. Despite socioeconomic status, acculturation may be an important factor in relation to these diseases. Older Hispanics who are more acculturated have higher rates of hypertension than do those Hispanics elders who are less acculturated. Institutionalized elderly Hispanics may be more functionally and mentally impaired than are non-Hispanic whites. The extended family provides significant support for the Hispanic elder due to strong family ties and connections, but referrals allowing family caregivers to access community services are necessary to avoid caregiver exhaustion. Various factors that may directly affect the ability of a physician to accurately diagnose or treat a Hispanic elder include communication problems, barriers to health care, and informal health-care services. Thorough evaluation by the physician of existing problems is essential and preventive measures are required to overcome multiple and complex health problems among older Hispanics. 3 tables, 23 references.

029

Mortality Differences Between Elderly Mexican Americans and Non-Hispanic Whites in San Antonio, Texas.

Form: Journal article.
Author: Espino, D.V.; Parra, E.O.; Kriehbiel, R.
Source: *Journal of the American Geriatrics Society.* 42(6):604-608, June 1994.

Abstract: Researchers examined differences in the causes of death between elderly Mexican Americans and non-Hispanic whites. The project was a cross-sectional study of all the death certificates of persons 65 years or older who died in Bexar County, Texas. The total population of the county was 1,169,911, with an ethnic composition of 47 percent Mexican American, 46 percent non-Hispanic white, and 7 percent African American or other. In addition to cause of death, information collected from death certificates included age, sex, race/ethnicity, place of birth, and date of death. In some cases, the cause of death included contributory causes in addition to the primary cause. Only Hispanics designated on the death certificates as Mexican Americans were included in the study. Investigators examined the 29 major causes of death in the United States and grouped all

remaining causes into a category labelled other. The categories included (1) acute myocardial infarction, (2) ischemic coronary disease, (3) congestive heart failure, (4) aortic aneurysm, (5) arteriosclerosis, (6) cardiopulmonary arrest, (7) hypertension, (8) other cardiac cause, (9) chronic obstructive pulmonary disease, (10) other pulmonary cause, (11) cognitive impairment, (12) stroke, (13) other neurological cause, (14) cancer, (15) renal failure, (16) nephritis, (17) diabetes mellitus, (18) septicemia/pyuria, (19) pneumonia/flu, (20) other infection, (21) cirrhosis, (22) gastro-intestinal hemorrhage, (23) ischemic bowel disease, (24) liver failure, (25) other gastro-intestinal cause, (26) multiple systemic, (27) accident, (28) homicide, (29) suicide, and (30) other. A total of 5,644 death certificates for elderly persons who died between January 1 and December 31, 1989, were reviewed for a total of 3,802 non-Hispanic whites (67 percent) and 1,842 Mexican Americans (33 percent). Mexican-American men and women demonstrated a greater than three-fold risk of death from diabetes mellitus compared with non-Hispanic whites. Diet, genetics, acculturation, and socioeconomic factors all appear to play a role in the severity of diabetes mellitus. Death from renal failure and multiple systemic problems was more than twice as common among Mexican Americans. Mexican Americans had a 50 percent higher rate of death from congestive heart failure than their non-Hispanic white counterparts. Among male participants, Mexican-Americans had a greater risk of myocardial infarction, ischemic coronary disease, and septicemia/pyuria. Compared with non-Hispanic whites, Mexican-American females had a greater risk of cirrhosis, but a lesser risk of chronic obstructive pulmonary disease. Underlying diabetic condition may explain the higher mortality rates from renal failure, systemic problems, and sepsis/pyuria among Mexican Americans. 1 table, 41 references.

030

Mortality in the Hispanic Population of Suffolk County, New York.

Form: Journal article.
Author: Polednak, A.P.
Source: *New York State Journal of Medicine.* 90(9):442-446, September 1990.

Abstract: A researcher examined mortality data on Hispanics in Suffolk County, New York, and compared it with data on whites in the same county during the years 1979-1983. The study used computerized individual records of all deaths in Suffolk County to identify deaths among residents, in which causes of death had been coded to the ninth revision of the International Classification of Diseases (ICD). The author calculated average annual age, sex, and cause-specific death rates (per 100,000 people) for all whites and Hispanics, and determined standardized mortality ratios (SMR's) for each group. Proportional mortality ratios (PMR's) for the Puerto Rican born were compared with those for non-Hispanic whites as reported on the death certificate. For comparison purposes, PMR's were calculated from mortality data for Puerto Rico in 1983. A chi-square test was used for analysis of PMR's for individual age strata; for analysis of SMR's, 95 percent confidence limits were based on the Poisson distribution. Results showed that SMR's for all causes were less than 1.00 for both male and female Hispanics, using the entire Hispanic population for the calculation of the expected number of deaths. Using only the Hispanic white population to calculate expected numbers of deaths (96.8 percent of the Hispanic sample), SMR's were still not greater than 1.00. SMR's were significantly lower than 1.00 for Hispanics for all neoplasms and ischemic heart disease. Significantly elevated SMR's were evident in Hispanics for diabetes mellitus in females and for both infectious diseases and homicides in males. Ninety-two percent of all decedents aged 45 years and older at the time of death and classified as Puerto Rican were born in Puerto Rico. The PMR for all neoplasms was significantly lower in Puerto Rican born females than white females aged 65 years or older and similar to the PMR for females in Puerto Rico. PMR's for diabetes mellitus were higher for Puerto Rico born than for non-Hispanic white female decedents, and were as high as those in females in Puerto Rico. PMR's for diabetes mellitus did not differ between Puerto Rican born and non-Hispanic white males in Suffolk County, and were lower than those for males in Puerto Rico. Puerto Rican born male decedents 45-64 years of age had a significantly lower PMR for ischemic heart disease then non-Hispanic white males in Suffolk County. For females 45-64 years of age, and for both sexes 65 years of age or older, PMR's for ischemic heart disease were similar by sex-ethnic group within Suffolk County, and consistently higher than those for Puerto Rico. 4 tables, 21 references.

See also 001, 006, 011

General Hispanic/Latino Health Context Issues and Considerations

Gender

031

Factors Related to Diabetes Mellitus in Puerto Rican Men.

Form: Journal article.
Author: Cruz-Vidal, M.; Costas, R.; Garcia-Palmieri, M.R.; Sorlie, P.D.; Hertzmark, E.
Source: *Diabetes.* 28(4):300-307, April 1979.

Abstract: Researchers made urban-rural comparisons of the prevalence of diabetes in a cohort of 2,567 rural and 6,190 urban participants aged 45-64 years. They used data from the Puerto Rico Heart Health Program, a prospective epidemiologic study begun in 1965 to investigate the risk factors of coronary heart disease in a cohort of 8,793 men. The participants were men in three urban and four rural municipalities of the northeast region of Puerto Rico. As part of a general history at the time of the initial examination, researchers asked participants (1) whether they had diabetes and if so, what form of treatment they were receiving, and (2) family history of diabetes in parents and siblings. Researchers computed participants' relative weight as the ratio of the observed weight to the ideal weight for the observed height, expressed as a percentage. Researchers routinely determined blood pressure, serum cholesterol, and blood glucose levels. Blood glucose levels were determined by the Somogyi-Nelson method on venous whole blood. During routine physical examination, assessment was made of the individual's peripheral vascular system. The prevalence of diabetes in the urban population was more than double that in the rural. Blood glucose concentrations were significantly higher in urban than in rural populations. In obese men, the urban and rural prevalence rates of diabetes are the same, but among relatively lean men, the prevalence in the urban area is twice that of the rural area. In general, the prevalence of diabetes increased with age and relative weight. It was associated with elevations of serum cholesterol, blood pressure, and fasting serum triglycerides. A family history that was positive for diabetes was found more commonly in persons with diabetes than in persons without diabetes. If there were a history in both a sibling and a parent, there was at least a threefold increased prevalence over those with no family history of diabetes. 5 figures, 8 tables, 12 references.

032

Greater Influence of Central Distribution of Adipose Tissue on Incidence of Non-Insulin-Dependent Diabetes in Women Than Men.

Form: Journal article.
Author: Haffner, S.M.; Mitchell, B.D.; Hazuda, H.P.; Stern, M.P.
Source: *American Journal of Clinical Nutrition.* 53(5):1312-1317, May 1991.

Abstract: Researchers examined (1) the effect of central adiposity on the incidence of noninsulin dependent diabetes mellitus (NIDDM) among men and women separately and (2) whether the effect of body fat distribution on NIDDM incidence was accounted for by hyperinsulinemia. Researchers report on results of the 8-year followup of 620 Mexican American men and women who (1) were initially enrolled in the San Antonio (Texas) Heart Study, (2) were free of diabetes at the baseline examination in 1979 to 1982, and (3) attended the followup study's medical examination 8 years later. Participants were from two low-income census tracts, one middle-income census tract, and one upper-income census tract. Vital status was ascertained on 98 percent of the originally enrolled participants. The followup examination consisted of an initial home or telephone interview followed by a medical examination performed in a mobile clinic located in the participant's neighborhood. At the followup examination, plasma glucose was measured in the fasting state and 2 hours after the administration of a 75-gram glucose equivalent load. The methods used for glucose and anthropometric measurements (height, weight, and subscapular and triceps skinfold thicknesses) were identical to those used in the baseline examination. Central adiposity was computed as the ratio of subscapular to triceps skinfold thickness. Diabetes mellitus was diagnosed according to the World Health Organization criteria. Age-adjusted means for continuous variables by sex were computed for participants who converted to diabetes and those who remained free of disease by two-way analysis of covariance. The effect of obesity and body fat distribution on the incidence of diabetes in each sex was evaluated by a test for trend. Multiple logistic regression analysis was used to estimate the odds ratio associated with each risk factor adjusted for all other risk factors. Results revealed that 16 of 254 men without diabetes initially and 27 of 366 women without diabetes initially had developed diabetes. Central adiposity was more strongly associated with diabetes incidence among women than among men. 4 tables, 37 references.

033

Health Beliefs of Mexican, Mexican American and Anglo American Women.

Form: Journal article.
Author: Castro, F.G.; Furth, P.; Karlow, H.
Source: *Hispanic Journal of Behavioral Sciences.* 6(4):365-383, December 1984.

Abstract: Researchers examined the health-illness beliefs as related to level of acculturation in 102 Mexican, Mexican American, and Anglo women to determine if less acculturated Mexican women as compared with more acculturated Mexican women and Anglo women have a significantly different conceptual system of health-illness beliefs in the health domains of (1) Mexican folk beliefs; (2) hot-cold theory of illness beliefs (e.g., a cold should be treated by drinking hot liquids); (3) beliefs of responsibility and control over own health; (4) cardiovascular disease beliefs; and (5) stress-illness beliefs. The women were interviewed in two locations: An outpatient primary care clinic in East Los Angeles, California, and a large university campus. Of the 72 university women, 32 were of Mexican origin. All 30 women from the clinic were of Mexican origin. The combined sample of Mexican-origin clinic and university women was categorized into low, medium, and high acculturation groups based upon their mean scores on the Acculturation Rating Scale for Mexican Americans (ARSMA). The ARSMA is a 20-item scale in which the participant answers questions on language preference and usage, cultural heritage, food and media preferences, and other items relevant to the Mexican-American cultural dimension. Four bilingual undergraduate psychology students were trained to administer a structured health interview that lasted an average of 45-48 minutes. With minor modification, the ARSMA was used both with Mexican-origin participants and with Anglo participants. In analyses of group differences on demographic variables, the low acculturation, bicultural, high acculturation, and Anglo women did not differ on monthly income, urban-rural background, and level of religious participation. The group means for age for the low acculturation, bicultural, high acculturation, and Anglo women were 41.9, 26.9, 27.9, and 19.2, respectively. After adjustments for the effects of age and health status, separate ANCOVA analyses were performed for prototypical scales of health belief: Folk, Hot-Cold, Responsibility, Cardiovascular, and Stress-Illness. A one-way ANCOVA with post-hoc comparisons was run for all the belief items of the scales to obtain a more detailed picture for acculturation group differences on each specific belief item. All of the Mexican-origin women, regardless of acculturation, expressed a mild level of belief in Mexican folk beliefs. The level of belief in hot-cold concepts varied inversely with level of acculturation; most women had a moderate acceptance of hot-cold beliefs. The Mexican-origin women had significantly lower responsibility scale scores than did Anglo women, and, compared to high acculturation women, the low acculturation and biculturation women had significantly lower sense of responsibility and control over their own health as characterized by a greater acceptance of powerful external agents, God, chance, and the doctor as determinants of health outcomes. Low acculturation women exhibited as strong a belief in cardiovascular and stress health-illness concepts as did the other groups of women. Results support the proposition that most Mexican Americans tend to have a dual system of folk and scientific health beliefs. The acceptance of scientific health-illness relationships appears to have outweighed acceptance of folk and hot-cold beliefs, even across levels of acculturation. 2 tables, 28 references.

See also 001, 006, 020

General Hispanic/Latino Health Context Issues and Considerations

Other

See 006, 017

Defining the Burden: Sizing the Problem of Diabetes Among Hispanics/Latinos

Descriptions of diabetes morbidity and/or mortality among Hispanics/Latinos

Insulin dependent diabetes mellitus (IDDM), Type I

034

Analysis of HLA-DQA1 and -DQB1 Genes in Mexican Americans With Insulin-Dependent Diabetes Mellitus.

Form: Journal article.
Author: Sanjeevi, C.B.; Zeidler, A.; Shaw, S.; Rotter, J.; Nepom, G.T.; Costin, G.; Raffel, L.; Eastman, S.; Kockum, I.; Wassmuth, R.; Lernmark, A.
Source: *Tissue Antigens.* 42(2):72-77, August 1993.

Abstract: Researchers analyzed DQA1 and DQB1 gene polymorphism and their association to insulin dependent diabetes mellitus (IDDM). They used 35 Mexican American persons with IDDM and 39 Mexican American control persons. All participants were residents of southern California attending adult or pediatric diabetes clinics at the Los Angeles County, University of Southern California (USC) Medical Center or USC Children's hospital. The patients were diagnosed based on the National Diabetes Data Group criteria for IDDM. All patients and controls were unrelated and informed consent was obtained from all participants. Genomic DNA was isolated from peripheral blood leukocytes, and TaqI digestion, agarose gel electrophoresis, blotting to nylon membranes, hybridization, stringency washing and autoradiography were performed by standard techniques. The study performed DRB and DQA typing by hybridizing TaqI-digested DNA with DRB and DQA probes. DQB typing was performed by hybridizing BamHI-cleaved DNA with DQB probe. Amplification of the second exon of the DQA1 and the DQB1 genes was done in 35 patients and 39 controls by the polymerase chain reaction (PCR) in a programmable thermal cycler. Researchers used Fisher's exact test to compare the allele frequencies between the two groups. Either DQB10302 or DQB10201 was present among 91 percent of the patients compared to 67 percent of controls. Either DQA10501 or DQA10301 was present in all patients compared to 74 percent of controls. All four of these genes, in cis or trans, were present in 43 percent of the patients compared to 8 percent of controls. 1 figure, 4 tables, 27 references.

035

Ancestral Origin of Insulin-Dependent Diabetes in Mexican-Americans.

Form: Journal article.
Author: Shaw, S.J.; Vadheim, C.M.; Rotter, J.I.; Costin, G.; Beshkov, Y.; Zeidler, A.
Source: *International Journal of Epidemiology.* 21(4):725-729, 1992.

Abstract: Researchers examined whether the occurrence of insulin dependent diabetes mellitus (IDDM) in Mexican Americans was related to Spanish genetic admixture. Eighty controls of Mexican origin and 106 Mexican Americans with IDDM were recruited from the diabetes adult outpatient and pediatric clinics at several Los Angeles, California, hospitals. Researchers defined patients as Mexican-American if at least three out of four grandparents were of Mexican origin. Diabetic index cases were defined according to the National Diabetes Group criteria. Trained staff members conducted interviews using a questionnaire developed by the research group with all of the patients and controls, as well as family members who were knowledgeable about family genetic history. Researchers made statistical comparisons between origin of individual grandparents from the IDDM families and origins of the control families. Differences were assessed using a chi-square test for significance. The student t-test was used to compare ages between relatives. Results showed that there were a number of significant differences in IDDM prevalence among patients according to grandparents' state of origin in Mexico. There was a significantly higher number of grandparents of IDDM index cases whose origins were in the states of Jalisco, Michoacan, and Mexico D.F. (31.4 percent versus 21.6 percent, 16.4 percent versus 10.6 percent, and 4.8 percent versus 0.7 percent, respectively). In contrast, there was a significantly greater number of control grandparents from the states of Zacatecas, Durango, and Chihuahua (7.5 percent versus 12.4 percent, 1.3 percent versus 7.6 percent, and 1.8 percent versus 5.5 percent, respectively). A total of 63.5 percent of the IDDM grandparents versus 54 percent of the control grandparents were from the southern states of Mexico, a statistically significant difference that supports the study hypothesis. 1 table, 27 references.

036

Antithyroid Antibodies in Hispanic Patients With Type I Diabetes Mellitus: Prevalence and Significance.

Form: Journal article.
Author: Frasier, S.D.; Penny, R.; Snyder, R.; Goldstein, I.; Graves, D.
Source: *American Journal of Diseases of Children.* 140(12):1278-1280, December 1986.

Abstract: Researchers evaluated the prevalence and significance of antithyroid antibodies (ATA) and antithyroid microsomal antibodies (AMA) in a group of Hispanic children and adolescents with insulin dependent (type I) diabetes mellitus. This mixed longitudinal prospective study involved 90 participants; 54 male and 36 female. Ages at the time of the initial measurement of antithyroid antibodies ranged from 11 months to 17 years, 9 months. Forty-four participants were first studied at the time of their initial diagnosis. The duration of diabetes at the time of initial testing in the remaining patients varied from 6 months to 13 years, 8 months. Of the 90 patients, 31 were seen on only one occasion. Fifty-nine patients were followed up for 6 to 12 months, 51 between 1 and 2 years, 23 between 3 and 4 years, 12 between 4 and 5 years, and 3 between 6 and 7 years. A control group contained 44 Hispanic children and adolescents who were seen for routine physical examinations. Laboratory studies included (1) antithyroglobulin antibodies (ATA), (2) antithyroid microsomal antibodies (AMA), and (3) serum concentrations of thyroxine and thyrotropin (TSH). Researchers repeated these studies at 6-month intervals in patients whose serum samples contained antithyroid antibodies and annually in patients whose serum contained no antibodies. ATA and AMA were measured by hemagglutination and thyroxine and TSH were measured by radioimmunoassay. Results showed ATA in 7.5 percent of patients and AMA in 34.8 percent. All serum samples that were positive for ATA also contained AMA. No sex difference existed in the prevalence of thyroid autoimmunity. Eight patients had a small, firm goiter, and one of the patients developed Graves' disease. Results suggest that a relatively high prevalence of AMA and no sex difference in thyroid autoimmunity may be unique features of Hispanic children and adolescents with type I diabetes mellitus. 16 references.

037

Clinical Characteristics of IDDM in Hispanics and Non-Hispanic Whites: Little Evidence of Heterogeneity by Ethnicity.

Form: Journal article.
Author: Kostraba, J.N.; Cruickshanks, K.J.; Neville, T.G.; Lawler-Heavner, J.; Chase, H.P.; Klingensmith, G.J.; Gay, E.C.; Hamman, R.F.
Source: *Diabetes Care.* 15(10):1303-1309, October 1992.

Abstract: Researchers present the results of a detailed substudy on the potential heterogeneity of diabetes by ethnicity in insulin dependent diabetes mellitus (IDDM) among participants in the Colorado IDDM Registry. The registry included individuals who were Colorado residents, less than age 18 years at diagnosis, placed on insulin within 2 weeks of diagnosis, and had diabetes not secondary to other conditions. Researchers compared measures of diabetes control, insulin secretion, body fat distribution, genetic markers of IDDM, and family history of diabetes in 73 Hispanic and 97 non-Hispanic white participants. Researchers collected questionnaire data on diabetes, medical history, and family history of diabetes. Researchers examined participants at one of several locations: (1) The University Hospital; (2) the Barbara Davis Center for Childhood Diabetes in Denver, Colorado; (3) field clinics held at local hospitals and in outlying areas; and (4) participants' homes. Most participants (124) attended the clinic, at which researchers measured height, weight, waist and hip circumference, skin fold thickness, HbA1, HLA, ICA's, and insulin secretion. Another 15 participants sent in blood samples for HLA and ICA analyses. Researchers performed stimulated C-peptide measurements on participants who had fasted before the clinic visit. Results showed that Hispanic participants were similar to non-Hispanic white participants in insulin dose, HbA1, HLA-DR antigens, ICA's, and family history of IDDM. Hispanic females had higher mean stimulated C-peptide levels compared with non-Hispanic white females, after adjusting for duration for diabetes (0.27 versus 0.11 nM/L (0.83 versus 0.33 ng/ml), p equal to 0.01). Hispanic females also had higher body mass index (BMI) (22.7 versus 20.9 kg/m2, p equal to 0.04), subscapular skin fold thickness (18.9 versus 15.0 mm, p equal to 0.04), and waist-to-hip ratio (0.81 versus 0.77, p equal to 0.03) than non-Hispanic white females. After controlling for diabetes duration, BMI, sex, and family history of noninsulin dependent diabetes (NIDDM), residual beta-cell function was associated significantly with Hispanic ethnicity, although the term accounted for just 3 percent of the overall variability in C-peptide levels. Findings demonstrated little evidence of heterogeneity by ethnicity of IDDM patients in the Colorado IDDM Registry. 1 figure, 4 tables, 31 references.

038

Colorado IDDM Registry: Lower Incidence of IDDM in Hispanics: Comparison of Disease Characteristics and Care Patterns in Biethnic Population.

Form: Journal article.
Author: Gay, E.C.; Hamman, R.F.; Carosone-Link, P.J.; Lezotte, D.C.; Cook, M.; Stroheker, R.; Klingensmith, G.; Chase, H.P.
Source: *Diabetes Care.* 12(10):701-708, November-December 1989.

Abstract: Researchers present descriptive data from the Colorado Insulin-Dependent Diabetes Mellitus (IDDM) Registry to assess disease characteristics and care patterns in a biethnic population. Patients (1) were diagnosed with IDDM between 1978 and 1983, (2) were under age 18 years at time of diagnosis, (3) were residents of Colorado when diagnosed, (4) were placed on insulin within 2 weeks of diagnosis, and (5) did not have diabetes secondary to other causes. Patients were reported to the registry by

their physicians. Statewide validation of reporting was performed through review of hospital discharge indexes in 95 percent of the hospitals. Data obtained through physicians' reports or hospital reviews included (1) residence at onset, (2) sex, (3) date of diagnosis, (4) date of birth, (5) race, (6) diagnosing physician, and (7) insulin status after treatment at diagnosis. With permission from the diagnosing physician, patients' parents were sent a questionnaire requesting (1) demographic and tracking information, (2) family history, (3) medical care and severity at diagnosis, (4) insulin use, and (5) acute complications since diagnosis. Nonresponders were sent a second questionnaire. Persistent nonresponders were telephoned and reminded to return the questionnaire. Researchers calculated IDDM incidence rates for Hispanic and non-Hispanic populations. Age adjustment (direct method) was calculated from the 1980 U.S. Census population. Confidence intervals on relative risks were determined with the method described by Kahn (An Introduction to Epidemiologic Methods, 1983). Estimates of cumulative risk were calculated with the technique by Schlesselman (Case Control Studies: Design, Conduct, Analysis, 1982). Chi-square tests of the independence of categorical variables used the SPSS statistical package. Significance tests comparing mean values were conducted with two-sample t-test. Of the 661 persons who were not of Spanish origin, or for whom Spanish origin was unknown, only 4.7 percent were reported African American or other and the remainder were reported as white. Incidence rates for Hispanics were significantly lower than those for non-Hispanics, although 95 percent confidence intervals overlapped for children aged 10-17 years. Age-adjusted rates were significantly lower among Hispanic than non-Hispanic males, whereas age-adjusted rates for females did not differ. An appendix lists the questions used to collect information about acute complications after diagnosis. 2 figures, 3 tables, 27 references.

039

Congenital Rubella Syndrome as a Model for Type 1 (Insulin-Dependent) Diabetes Mellitus: Increased Prevalence of Islet Cell Surface Antibodies.

Form: Journal article.
Author: Ginsberg-Fellner, F.; Witt, M.E.; Yagihashi, S.; Dobersen, M.J.; Taub, F.; Fedun, B.; McEvoy, R.C.; Roman, S.H.; Davies, T.F.; Cooper, L.Z.; Rubinstein, P.; Notkins, A.L.
Source: *Diabetologia.* 27(Supplement):87-89, 1984.

Abstract: Researchers in New York City evaluated 241 children diagnosed with congenital rubella to determine their susceptibility to insulin dependent diabetes mellitus (IDDM). The sample had a mean age of 17.4 years and was 65 percent African American or Hispanic American and 52 percent male. Thirty of the children were considered to have diabetes according to the criteria of the National Diabetes Data Group; 15 were constantly insulin dependent; 1 had received insulin intermittently; and 14 had grossly abnormal oral glucose tolerance. Twenty-six of the children with diabetes had complete HLA antibody testing, which was done using contrast fluorescence. Researchers also measured pancreatic islet cell surface or cytotoxic antibodies (ICSA) and conducted oral glucose tolerance tests on participants. Among the 26 children tested for HLA antibodies, 21 had HLA-DR3 or HLA-DR4 type antibodies, 4 had both HLA-DR3 and HLA-DR4, 2 had B8 or B18 in combination with other HLA-DR alleles, and one had HLA-B7 associated with DR4 and DR5. Compared to 162 children with congenital rubella but without diabetes and to 163 control persons in the New York City area, the 26 children with congenital rubella and diabetes had significantly lower percentages of HLA-DR2 and significantly higher percentages of HLA-DR3. There was no significant difference in the prevalence rate of ICSA according to specific

DR antigens; the overall prevalence of ICSA in the patients with IDDM was 20 percent versus under 4 percent in controls. Thirty-four percent of the children with congenital rubella also had antimicrosomal or antithyroglobulin antibodies, with a frequency of 88 percent in children with congenital rubella and with positive ICSA. The data demonstrate that persons developing IDDM with congenital rubella have the genetic and immunological features of classical IDDM (i.e., the presence of HLA-DR3, the absence of HLA-DR2, islet cell surface antibodies before decompensation, and an increased prevalence of antithyroid antibodies). 1 table, 17 references.

040

Diabetes in Hispanic Americans.

Form: Book chapter.
Author: Stern, M.P.; Mitchell, B.D.
Source: IN: *Diabetes in America.* Second Edition. National Diabetes Data Group. Bethesda, MD, US Department of Health and Human Services, National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases, pp. 631-659, 1995.
Availability: National Diabetes Information Clearinghouse, 1 Information Way, Bethesda, MD 20892. (301) 654-3327. NIH Publication No. 95-1468.

Abstract: Diabetes in Hispanic Americans, a book chapter in Diabetes in America, reviews the research literature concerning diabetes mellitus among Hispanic Americans. Most of the information on diabetes among Hispanic Americans comes from four large studies: The San Antonio (Texas) Heart Study, the San Luis Valley (Colorado) Diabetes Study, the Starr County (Texas) Study, and the Hispanic Health and Nutrition Examination Survey (HHANES). These studies have clearly established that the prevalence of noninsulin dependent diabetes mellitus (NIDDM) is two to three times higher in Mexican Americans than in non-Hispanic whites. HHANES, the only one of the studies to include information on Cuban Americans in the Miami area and Puerto Ricans in the New York City area, shows that diabetes prevalence among Puerto Ricans is as high as among Mexican Americans; Cuban Americans have a lower prevalence that is still 30-50 percent higher than that found among non-Hispanic whites. In contrast to NIDDM, registry data indicate that the incidence of insulin dependent diabetes mellitus is lower among Hispanics than non-Hispanics. Mexican Americans with diabetes experience higher mortality than do Mexican Americans without diabetes. The prevalence of myocardial infarction and coronary heart disease mortality are lower in Mexican-American men, with or without diabetes, than in the corresponding category of non-Hispanic white men, but there is no similar ethnic difference among women. There is evidence that Mexican Americans with diabetes have a higher prevalence of peripheral vascular disease as assessed by ankle-arm blood pressure ratios than do non-Hispanic whites with diabetes. The studies reveal a discrepancy with respect to microvascular complications of diabetes: The San Antonio Heart Study and the Third National Health and Nutrition Examination Survey (NHANES III) show an excess of microvascular complications among Mexican Americans with diabetes compared to non-Hispanic whites with diabetes, although the San Luis Valley Diabetes Study shows no such difference. Although findings differ between the San Antonio Heart Study and the San Luis Valley Diabetes Study, statewide surveillance results indicate that the rates of renal replacement therapy for diabetes-related end-stage renal disease (ESRD, kidney dialysis, and transplant) are markedly higher among Hispanics than non-Hispanics in both Colorado and Texas. Moreover, this excess is greater than can be explained on the basis of the higher diabetes prevalence among Hispanics. In Texas, the survival of Mexican Americans with diabetes on dialysis is longer than for non-Hispanic whites with diabetes on dialysis.

There is evidence that the rate of microvascular complications of diabetes is increased in San Antonio Mexican Americans with diabetes who have less effective health insurance coverage. Little is known about behavioral factors that may mediate sociocultural effects, such as diet. There is a strong ecological association between the percent of Native American genetic admixture and the prevalence of diabetes in various Hispanic and Native American populations. Since admixture and sociocultural factors co-vary, it is difficult to disentangle their joint effects on diabetes risk.

041

Different HLA Haplotypes in Mexican Americans With IDDM.

Form: Journal article.
Author: Vadheim, C.M.; Zeidler, A.; Rotter, J.I.; Langbaum, M.; Shulman, I.A.; Spencer, M.R.; Costin, G.; Riley, W.J.; Maclaren, N.K.
Source: *Diabetes Care.* 12(7):497-500, July-August 1989.

Abstract: To determine whether human leukocyte antigen (HLA) haplotypes differ between ethnic groups, researchers compared 105 HLA haplotypes from 55 Mexican-Americans with insulin dependent diabetes mellitus (IDDM) with 272 haplotypes from 136 non-Hispanic whites with IDDM. Since the accurate determination of genotypes and haplotypes requires the study of family units, all patients with diabetes in the study had one or more siblings with IDDM. All patients met the National Diabetes Data Group (NDDG) criteria for IDDM, and all were residents of southern California. All Mexican American patients were either first- or second-generation Americans. To define haplotypes and genotypes (rather than phenotypes), researchers studied at least one parent and one sibling in addition to the diabetes proband. Researchers determined alleles at the HLA-A, B, and DR loci for all patients and family members. They determined individual HLA haplotypes by studying the segregation of HLA alleles through the family pedigrees. In this manner, researchers delineated 105 independent Mexican American haplotypes and 262 non-Hispanic white haplotypes. In the Mexican American group, HLA-DR3 and HLA-DR4 were the most common HLA-DR alleles and were present in comparable frequencies in the non-Hispanic white group (HLA-DR3, 27 percent of Mexican American and 29 percent of non-Hispanic white haplotypes; DR4, 46 percent of Mexican American and 43 percent of non-Hispanic white haplotypes). However, the HLA-B/DR containing haplotypes and haplotype frequencies differed between the two groups. Several common haplotypes (B8/DR3, B15/DR4) in the non-Hispanic white group occurred less frequently in the Mexican American group. In contrast, uncommon haplotypes in the non-Hispanic white group comprised nearly 50 percent of the DR4-containing haplotypes (B35/DR4, B40/DR4, B44/DR4) in the Mexican American group. Even though both DR3- and DR4-haplotype frequencies differed significantly between the two groups, both ethnic groups had similar relative frequencies of DR3-containing haplotypes but not DR4-containing haplotypes. Findings suggest that different susceptibilities are provided by the haplotypes carrying the DR3 and DR4 alleles. 2 tables, 19 references.

042

Epidemiology and Immunogenetics in Recently Diagnosed Venezuelan Children With Insulin-Dependent Diabetes Mellitus.

Form: Journal article.
Author: Gunczler, P.; Lanes, R.; Layrisse, Z.; Esparza, B.; Salas, R.; Hernandez, L.; Arnaiz-Villena, A.
Source: *Journal of Pediatric Endocrinology.* 6(2):165-171, 1993.

Abstract: Between 1988 and 1991, researchers evaluated 91 children in Venezuela who were newly diagnosed with insulin dependent diabetes mellitus (IDDM) for several genetic and immunologic markers. Inclusion criteria were chronological age under 21 years, IDDM diagnosed in the 10 days prior to hospital admission, and discharge from the hospital on insulin treatment. The study population included 51 females and 40 males; the mean age was 7.8 years. After obtaining parental consent, blood, nasal-pharyngeal, and stool samples were collected from 38 of the children, their parents, and their siblings and analyzed for human leucocyte antigens (HLA) alleles, islet cell antibodies (ICA), insulin autoantibodies (IAA), viral cultures, and antibody titers. The sera of 21 donors without IDDM (mean age 23 years, range 5-45 years) were used as control samples. Researchers (1) defined HLA antigens by serology using the lympho-cytotoxicity micromethod, (2) obtained haplotypes after analysis of the phenotypes assigned to each individual, (3) sampled levels of IAA using a competitive ELISA technique on microplates coated with 3 microg/well of human insulin dissolved in a carbonate/bicarbonate buffer and blocked with 20 percent calf serum phosphate buffered saline, and (4) determined ICA's on serum samples by indirect immunofluorescence on cryostat sections of human pancreas. Specific antibody titers were conducted for the viral agents of rubella, mumps, measles, cytomegalovirus, herpes simplex, varicella zoster, and Coxsackie-B. Two clear peaks of onset of IDDM were noted at ages 2 to 3 and 7 to 11 years; a seasonal variation in the peak incidence of IDDM was noted, with peaks in February to March and August to October. Clinical results revealed that 11 percent of first-degree relatives of the children with IDDM had a family history of IDDM, while 21 percent of second-degree relatives had IDDM. Eighty-six percent of the children with IDDM presented a history of a prior infectious process in the 2 months preceding diagnosis; 64 percent had an upper respiratory infection, 18 percent had rubella or varicella, and the rest had other infections of the digestive or urinary tract. Laboratory results showed that 33 patients (87 percent) presented with HLA-DR3 and/or HLA-DR4 alleles (versus 36 percent in the Venezuelan general population); only 5 patients had other HLA-DR alleles. The most frequent association found in the children with IDDM was HLA-DR3DQW2 and HLA-DR4DQW8. Nineteen patients (55.9 percent) had positive ICA's, while three (7.9 percent) were IAA positive. Only 3 of 11 HLA-identical siblings presented with positive ICA's, while none of them had any detectable IAA. Researchers identified 11 children with elevated titers for cytomegalovirus antibodies, 7 children with measles antibodies, 4 children with mumps antibodies, 3 children with herpes antibodies, 2 children with varicella antibodies, and none with rubella or Coxsackie-B antibodies. The use of DQ-B restriction fragment length polymorphism analysis may enhance ability to identify individuals at risk for IDDM. 2 tables, 33 references.

043

Ethnic Differences in Human Leukocyte Antigen Markers of Susceptibility to IDDM.

Form: Journal article.
Author: Cruickshanks, K.J.; Jobim, L.F.; Lawler-Heavner, J.; Neville, T.G.; Gay, E.C.; Chase, H.P.; Klingensmith, G.; Todd, J.A.; Hamman, R.F.
Source: *Diabetes Care.* 17(2):132-137, February 1994.

Abstract: Researchers examined whether genetic differences affected the risk of developing insulin dependent diabetes mellitus (IDDM) in Hispanic versus non-Hispanic white children in Colorado. In particular, they studied whether the HLA-DR3, HLA-DR4, and DQB1 alleles encoding aspartic acid (ASP) were associated with risk of IDDM. Study participants came from the Colorado IDDM Registry, a statewide, population-based incidence registry that identified possible participants through a physician surveillance network and periodic hospital record reviews. Children eligible for inclusion were residents of the state, under age 18 years at diagnosis of IDDM between January 1978 and December 1988, and placed on insulin therapy within 2 weeks of the diagnosis date. Persons with diabetes secondary to other disorders were excluded. Researchers recruited as participants 62 Hispanics with diabetes, 46 Hispanics without diabetes as controls, 82 non-Hispanic whites with diabetes, and 63 non-Hispanic whites without diabetes as controls. All participants received an examination that included (1) analysis of anthropometric skin reflectance, (2) blood pressure measurement, (3) a blood draw, (4) questions about family history and diet characteristics, and (5) a physical activity inventory. Researchers performed HLA serologic typing using commercially available trays and identified HLA-DQA1 and HLA-DQB1 alleles using the polymerase chain reaction and dot-blot analyses. Data were evaluated using the Statistical Analysis System, including Wolf's method and Haldane's correction for small samples, tests of heterogeneity, and differences in proportions. No significant differences were found in age, duration of IDDM, age at diagnosis of diabetes, or sex for IDDM participants by status in either ethnic group. HLA-DR3, HLA-DR4, and ASP were associated with IDDM in both ethnic groups. The prevalence of HLA-DR3 was 75 percent lower among Hispanic controls than non-Hispanic white controls. No ethnic differences were observed in the prevalences of HLA-DR4 or ASP between groups. Data suggest that the markers of genetic susceptibility to IDDM and the degree of risk they confer do not differ between Hispanics and non-Hispanic whites. 3 tables, 39 references.

044

Evaluation of Epidemiology and Immunogenetics of IDDM in Spanish- and Portuguese-Heritage Registries: A Key to Understanding the Etiology of IDDM?

Form: Journal article.
Corporate Author: Diabetes Epidemiology Research International Group.
Source: *Diabetes Care.* 12(7):487-493, July-August 1989.

Abstract: Researchers describe an approach to the study of insulin dependent diabetes mellitus (IDDM) in Spanish and Portuguese heritage populations, which they believe may provide information on the identification of the determinants of IDDM worldwide. Spain and Portugal have had a major influence on the genetic makeup and lifestyles of many populations around the world. People of Spanish and Portuguese descent have complex origins; although the greatest contribution has been from northern European whites, there has been admixture with the Berbers from Africa, the Romans, and the Moors. The first phase of research on IDDM in these populations should be the development of IDDM incidence registries in informative populations of Spanish and Portuguese ancestry in Europe, North America, and Latin America. The development of accurate incidence registries involves three main components: Case ascertainment, validation of the completeness of the registry, and collection of standard personal and medical information pertinent to each case. Once the registries are developed and incidence is reported, the next level of research will be to compare the descriptive epidemiology of IDDM in the populations with varied incidences. The populations identified in the registries can serve as population pools for more in-depth evaluation of specific viral and/or immunogenetic hypotheses. Research could begin to evaluate the degree to which ethnic and HLA differences explain the international differences in risk. A standardized approach for collecting family history could then be used to contrast the incidence across varied populations. 1 figure, 2 tables, 44 references.

045

HLA-DQBeta57 in Hispanic Patients With Insulin dependent Diabetes Mellitus.

Form: Journal article.
Author: Lee, G.; Shamma, F.N.; Diamond, M.P.; Lee, J.
Source: *American Journal of Obstetrics and Gynecology.* 167(6):1565-1570, December 1992.

Abstract: Researchers conducted a study to investigate the distribution of HLA-DQBeta57 as a genetic marker of susceptibility for insulin dependent diabetes mellitus (IDDM) in the Hispanic population. Researchers tested 15 Hispanic patients with juvenile-onset IDDM for human leukocyte antigen (HLA) typing over the course of 2 years by obtaining 3 heparinized, 10-centimeter tubes of venous blood per patient when they were seen for ambulatory care services. Controls were 44 normal Hispanic adults undergoing HLA typing for tissue donation purposes. All participants were of Puerto Rican descent and were unrelated. Researchers identified individual test results only by number. They isolated lymphocytes from whole blood with a standard Ficoll-Hypaque gradient method. Researchers partitioned lymphocytes for serologic typing of class I and class II antigens. The Hispanics with IDDM showed a significant increase in homozygosity for a nonaspartate amino acid (p equal to 0.023) over a control group of Hispanic participants without diabetes. Results also showed a high rate of heterozygosity for aspartate (53.3 percent) in Hispanic participants with IDDM. HLA-DQB57 distribution in the Hispanic population is distinct from that in the Caucasian population. Findings indicate that a single aspartate does not protect against IDDM in Hispanic persons. 3 figures, 2 tables, 19 references.

046

HLA-DRw Antigens in Mexican-American and Black-American Diabetic Patients.

Form: Journal article.
Author: Zeidler, A.; Loon, J.; Frasier, S.D.; Kumar, D.; Penny, R.; Terasaki, P.
Source: *Diabetes.* 29(4):247-250, April 1980.

Abstract: Researchers conducted a study of Human Leukocyte Antigen (HLA)-A, B and C antigens in 67 unrelated Mexican American and 38 unrelated African-American patients whose diabetes began before age 31 years. They also studied 60 Mexican Americans and 34 African Americans for HLA-DRw antigens. Researchers divided the patients with diabetes, all of whom injected insulin, into two groups. Group one consisted of juvenile-onset, insulin dependent, ketosis-prone patients whose disease began before age 19 years; none were overweight. Group two contained insulin-treated patients whose diabetes began between ages 19-31 years;

they were not prone to ketosis and were more than 20 percent above their ideal weight. Control populations consisted of 332 Mexican Americans for HLA-A, HLA-B, and HLA-C and 189 Mexican Americans for HLA-DRw; and 367 African Americans for HLA-A, HLA-B, and HLA-C and 145 African Americans for HLA-DRw. HLA-A, HLA-B, and HLA-C antigens were determined on peripheral blood lymphocytes by the microdroplet lymphocyte cytotoxicity test. Researchers performed HLA-DRw antigen typing on B-cell-enriched lymphocyte populations by microtoxicity testing. Researchers conducted chi-square tests for significance and relative risk for the disease, comparing the frequencies of HLA-A, HLA-B, and HLA-C antigens among Mexican American patients in groups one and two with those found in the control group. Analysis did not show an increased frequency of HLA-B8, HLA-B15, or HLA-Cw3 among Mexican Americans with diabetes, as has been demonstrated in comparable white patients. Researchers also did not find any differences in the frequency of HLA-A, HLA-B, or HLA-C antigens among African-American patients with diabetes and in controls. Results did show, however, that patients of Mexican American origin with juvenile-onset diabetes whose disease began before age 19 years demonstrated a significant increase in HLA-DRw4. Results showed a significant increase in HLA-DRw4 in African Americans with juvenile-onset diabetes mellitus. Researchers did not detect HLA-DRw2 in any patient with juvenile-onset diabetes in either ethnic group. Findings revealed a significant association between HLA-B18 and HLA-DRw3 among Mexican American patients with juvenile-onset diabetes. Findings support the hypothesis that HLA-DRw antigens play a major role in determining the susceptibility to juvenile-onset diabetes mellitus. 4 tables, 27 references.

047

Incidence of Insulin-Dependent Diabetes Mellitus in Colorado.

Form: Journal article.
Author: Kostraba, J.N.; Gay, E.C.; Cai, Y.; Cruickshanks, K.J.; Rewers, M.J.; Klingensmith, G.J.; Chase, H.P.; Hamman, R.F.
Source: *Epidemiology.* 3(3):232-238, May 1992.

Abstract: Researchers examined the incidence of insulin dependent diabetes mellitus (IDDM) in children aged 17 years and under in Colorado from 1978 to 1988. Eligible study participants came from the Colorado Insulin Dependent Diabetes Mellitus Registry, an ongoing registry designed to ascertain all new cases of IDDM in the state. Criteria for inclusion in the registry included the following: (1) Diagnosed with IDDM since January 1, 1978, and for this study, through December 31, 1988; (2) resident of Colorado at the time of diagnosis; (3) less than 18 years old at diagnosis; (4) placed on insulin within 2 weeks of diagnosis; and (5) diabetes not secondary to other conditions. New cases of IDDM were ascertained for the registry using a surveillance system based on physician reporting. Researchers examined the incidence of IDDM separately for Hispanics and non-Hispanics, since Hispanics represent the largest minority in Colorado (12 percent). Two rounds of validation of medical records in the registry were conducted to measure the completeness of case ascertainment; the overall ascertainment of the registry was determined to be 93.3 percent. Researchers used incidence rate ratios (RR's) and confidence intervals (CI's) from a Poisson distribution to measure the difference in diabetes risk by age, sex, and ethnicity. Poisson distribution models were fitted to the data using maximum likelihood estimation in a statistical package called Generalized Linear Interactive Modeling (GLIM). During the 11-year study period, 1,376 children were registered as new cases of IDDM and this figure, combined with

1980 U.S. Census data to determine population cohorts, yielded a crude incidence rate of 14.5/100,000 person-years. Of the 1,333 persons with IDDM whose ethnicity was ascertained, 1,198 were non-Hispanic (95.3 percent) and 4.7 percent were African American or other including 135 Hispanic persons. The age-adjusted incidence rate in Hispanics (8.7/100,000; 95 percent CI equal to 7.3-10.3) was lower than that in non-Hispanics (15.5/100,000; 95 percent CI equal to 14.5-16.4)(RR equal to 0.6 percent, 95 percent CI equal to 0.4-0.8). Hispanic females were at higher risk for IDDM than were Hispanic males (RR equal to 1.5, 95 percent CI equal to 1.1-2.1). In non-Hispanics, females were at slightly lower risk for diabetes compared with males (RR equal to 0.9, 95 percent CI equal to 0.8-1.0). Incidence rates were higher in winter and lower in summer for children 5-17 years old. Children diagnosed before the age of 5 years showed no significant seasonal pattern, although peak incidences were observed in autumn and spring. There was no evidence of a year-to-year variability, linear trend, or birth cohort effect in diabetes incidence overall or by ethnic group. 3 figures, 2 tables, 38 references.

048

Prevalence of Thyroid Autoimmunity in Insulin Dependent Diabetes Mellitus in the Bayamon Region.

Form: Journal article.
Author: Sanchez-Lugo, F.
Source: *Boletin: Asociacion Medica de Puerto Rico.* 83(2):54-57, February 1991.

Abstract: A researcher examined the prevalence of thyroid autoimmunity in the pediatric population of persons with insulin dependent diabetes mellitus (IDDM) in Bayamon, Puerto Rico. Participants included 78 persons with IDDM, aged 1 to 20 years with equal sex distribution, who were followed at several clinics in Bayamon between February and June 1988. All participants were screened for markers of thyroid autoimmunity and underwent thyroid function tests, which included measurement of thyrotropin (TSH) free thyroxine (FT4) and thyroid microsomal autoantibodies (AMA). Results showed that 12 patients (10 females and 2 males) had evidence of goiter, which was defined as thyroids more than 2 cm when measured from the lower isthmus to both upper poles. Nine of the ten females with goiter and one of the two males with goiter had positive AMA titers. One female with goiter had a TSH level of 92.3 micro international units uIu/ml (the only hypothyroid patient found in the study). Females had a mean age at diagnosis of IDDM with thyroid dysfunction of 7.7 years with an age range of 3-15 years, while both males with goiter were age 13 years. The overall prevalence of thyroid autoimmunity detected in the population was 15 percent; 40 percent had goiter and most were female (9 out of 12). The sexual predisposition in females to thyroid dysfunction was statistically significant. Goiter was positively correlated with thyroid autoimmunity. 6 tables, 13 references.

049

Racial Differences in Incidence of Juvenile-onset Type 1 Diabetes: Epidemiologic Studies in Southern California.

Form: Journal article.
Author: Lorenzi, M.; Cagliero, E.; Schmidt, N.J.
Source: *Diabetologia.* 28(10):734-738, October 1985.

Abstract: An investigation addressed patients aged 0-19 years diagnosed with insulin dependent diabetes mellitus (Type 1 Diabetes). Researchers collected data through a retrospective review of medical records in 19 hospitals in San Diego, California. The reliability of this method was based on two assumptions: (1) Newly discovered juvenile-onset insulin dependent diabetes patients are referred to a hospital and (2) referrals are made to hospitals with a pediatric or a medical ward. To base computations on 1980 census data, researchers investigated the years 1978-1981. Researchers contacted all 19 hospitals in San Diego with pediatric or medical wards and requested to review all records relative to hospital admissions of persons aged 0-19 years with a diagnosis of diabetes mellitus for the period July 1978-June 1981. On a standardized form, investigators collected (1) patient's initials and hospital number; (2) sex; (3) race; (4) birth date; (5) place of residence; (6) date of diagnosis of diabetes; (7) laboratory values on admission for plasma glucose, ketones, pH or bicarbonate, and urine glucose and ketones; (8) stated duration of polyuria, polydipsia, and weight loss; (9) reported recent illnesses and more remote illnesses; (10) overall medical history; and (11) family history. A total of 95 cases were identified (54 males and 41 females). Analysis of incidence was restricted to patients whose residence was in San Diego and was computed on the basis of the city's demographic data provided on the 1980 U.S. Census. Seasonal variation in incidence was analyzed by grouping the frequencies into four seasons: December-February, March-May, June-August, and September-November. Statistical analysis of incidence and seasonality data was performed with chi-square test statistic of the observed and expected values. For 1978 through 1981, the mean annual incidence of diabetes was 7.3 cases per 100,000, with no statistical difference between the sexes. The observed incidence rates in various ethnic groups was significantly different from expected, with an excess of cases among whites and fewer than expected cases among Mexicans, African Americans, and Asian Americans. There was no identifiable seasonal trend. Results reveal that among multiple racial groups living in the same environment, whites are at the highest risk of developing juvenile-onset Type 1 diabetes. 2 figures, 1 table, 26 references.

Defining the Burden: Sizing the Problem of Diabetes Among Hispanics/Latinos

Descriptions of diabetes morbidity and/or mortality among Hispanics/Latinos

Noninsulin dependent diabetes mellitus (NIDDM), Type II

050

Blood Pressure, Insulin, and C-Peptide Levels in San Luis Valley, Colorado.

Form: Journal article.
Author: Every, N.R.; Boyko, E.J.; Keane, E.M.; Marshall, J.A.; Rewers, M.; Hamman, R.F.
Source: *Diabetes Care.* 16(12):1543-1550, December 1993.

Abstract: Researchers conducted a cross-sectional analysis of 895 normoglycemic members of a biethnic community in Colorado who were selected from a control group recruited for a geographically-based study of diabetes mellitus prevalence and risk factors. All participants had normal glucose tolerance as judged by a 75-gram oral glucose tolerance test interpreted using World Health Organization (WHO) criteria. None of the participants were taking antihypertensive medication. Informed consent was obtained from all study participants before data collection. Researchers measured fasting and oral glucose-stimulated plasma glucose, fasting serum insulin, and plasma C-peptide levels. Glucose was measured by the glucose oxidase method, serum insulin by double antibody RIA, and C-peptide levels. After participants had rested supine for 5 minutes, systolic blood pressure and fifth-phase diastolic blood pressure were auscultated from the right arm using a standard mercury sphygmomanometer with a pediatric or adult cuff of the appropriate size. Three measurements were taken, and the mean of the second and third was used. Ethnic group was determined by a self-report based on the person's response to the 1980 U.S. Census questions regarding Hispanic origin. During a study clinic visit, researchers measured height, weight, body mass index (BMI), waist circumference, and hip circumference. Multiple linear regression analysis was used to (1) control for the potential confounding factors of age, sex, BMI, waist-to-hip ratio, and ethnicity and (2) test for the presence of first and higher order interactions between insulin or C-peptide level and potential confounding factors. Among all participants, diastolic blood pressure significantly increased with increasing levels of both hormones (insulin coefficient 0.197, P equals 0.013 and C-peptide coefficient 0.0436, P equals 0.0004), whereas systolic blood pressure was significantly related to fasting C-peptide level. These relationships were similar in magnitude for both Hispanic and non-Hispanic white persons, but were diminished among women and participants with a higher body mass index. 4 tables, 53 references.

051

Diabetes Among Mexican Americans in Starr County, Texas.

Form: Journal article.
Author: Hanis, C.L.; Ferrell, R.E.; Barton, S.A.; Aguilar, L.; Garza-Ibarra, A.; Tulloch, B.R.; Garcia, C.A.; Schull, W.J.
Source: *American Journal of Epidemiology.* 118(5):659-672, November 1983.

Abstract: To assess the prevalence and morbidity of noninsulin dependent diabetes mellitus (NIDDM) among Mexican Americans, researchers randomly sampled 14 percent of the population of Starr County, Texas. They limited their screening to three towns that constitute 50.4 percent of the county population. Beginning in February 1981, researchers randomly sampled blocks from each of these urban areas in proportion to the size of the town and the number of potential dwelling units on each block. For each selected block, a team of field workers contacted every dwelling unit to elicit participation of and obtain data on all individuals over age 14 years. Within each dwelling unit, researchers enumerated eligible participants, collected demographic data, identified family structural relationships, and obtained informed consent from the individuals. Each participant answered questions about his or her health status and contributed two heparinized capillary tubes of whole blood collected from a finger prick. The field team used one drop of blood for an immediate casual blood glucose determination. Individuals with elevated blood glucose levels were scheduled for a 4-hour fasting blood glucose level test, and if necessary, for an oral glucose tolerance test following an overnight fast. No direct measures of body weight were obtained; however, classification of body shape was made based on comparison with reference silhouettes. Age-specific prevalences of diabetes for males ranged from 0 percent in males aged 15-24 years to 17.6 percent in those over age 75 years. Rates for females ranged from 0.4 percent in those aged 15-24 years to a high of 19.0 percent in those aged 55-64 years. In both sexes, the rates are relatively low for persons under age 45 years with a sharp increase in those aged 45-54 years and high rates prevailing in the older age groups. 5 figures, 5 tables, 13 references.

052

Diabetes Mortality Among New Mexico's American Indian, Hispanic, and Non-Hispanic White Populations, 1958-1987.

Form: Journal article.
Author: Carter, J.S.; Wiggins, C.L.; Becker, T.M.; Key, C.R.; Samet, J.M.
Source: *Diabetes Care.* 16(Supplement 1):306-309, January 1993.

Abstract: Researchers studied New Mexico's Native American, Hispanic, and non-Hispanic white populations over a 30-year period to determine diabetes mortality rates. Researchers used death certificates obtained from the New Mexico Bureau of Vital Statistics to identify diabetes as an underlying cause of death by ethnic group in New Mexico during each 5-year period from 1958 through 1987. Researchers calculated the age-adjusted rates by ethnic group and sex and compared them with United States white age-adjusted rates during the same time period. Cause of death was coded according to the seventh revision of the ICD for 1958-1968, the eighth ICD revision for 1969-1978, and the ninth ICD revision for 1979-1987. For comparison, researchers obtained diabetes mortality rates of the United States white population for the 30-year period from published sources. The New Mexico Bureau of Vital Statistics assigned ethnicity of individuals on the basis of information contained on the death certificates. Researchers calculated age-adjusted mortality rates by direct method and standardized to the 1970 United States standard million population. They assessed temporal trends of these rates by ethnic group and sex by linear regression. Researchers performed all analyses with standard programs of the Statistical Analysis System (SAS). Age-adjusted diabetes mortality rates for Native Americans and Hispanics increased throughout the 30-year period, and far exceeded rates for New Mexico non-Hispanic whites and United States whites by the 1983-1987 time period (25.3, 40.5, and 12.5

per 100,000 for Hispanics, Native Americans, and United States whites, respectively). The rates increased most dramatically among the state's Native Americans, increasing 550 percent among women and 249 percent among men. Hispanic women and men experienced increases of 112 percent and 140 percent, respectively. 2 tables, 28 references.

053

Diabetes in Adults Is Now a Third World Problem.

Form: Journal article.
Author: King, H.; Rewers, M.
Source: *Ethnicity and Disease.* 3(Supplement):S67-S74, 1993.

Abstract: Researchers report data from selected populations in World Health Organization (WHO) regions on the global prevalences of diabetes and impaired glucose tolerance (IGT). In examining diabetes prevalence in unbiased adult population samples, researchers used the WHO diagnostic criteria for glucose intolerance. Data were obtained for over 70 populations in over 30 countries worldwide; the total study sample included more than 150,000 participants. In African and Asian populations, diabetes was rarest (1 percent) among the Tanzanian rural Bantu. Diabetes was also rare in Da Qing in China and in rural India. Prevalence was close to 10 percent among Tunisian Arabs, 14 percent in Omanis, and between 10 and 20 percent among migrant Indian populations. The prevalence exceeded 10 percent among the Chinese Mauritians. Among American populations, prevalence was lowest (less than 1 percent) in the rural Mapuche Indians of Chile. African Americans in the United States had a higher risk (about 10 percent) compared to whites (5-7 percent). Hispanic Americans had a prevalence of approximately 10-20 percent and was inversely related to average income; in the Pima Indians, diabetes reached 50 percent prevalence among those aged 30-64 years. In European populations, the prevalence was generally lower, ranging from 2-4 percent among Siberian Russians to 10 percent in Italy and Malta. In Pacific populations, the prevalence was highly variable. No diabetes was recorded in a small highland population sample in Papua New Guinea, and prevalence was low in rural Fijian Melanesians. Moderate rates were observed in urban Melanesians and in Polynesians. Rates were higher among urbanized Micronesians and especially among the Nauruans (close to 40 percent). Since IGT indicates a high risk of subsequent diabetes and associated disorders such as cardiovascular disease, the combined prevalence of diabetes and IGT is a useful measure of the public health impact of glucose intolerance in a given population. Apart from the Mapuche Indians, the Chinese in Da Qing, certain rural Pacific Islanders, and the Poles, all communities demonstrated prevalences of total glucose intolerance in excess of 10 percent. Results led to three important conclusions: (1) An apparent epidemic of diabetes has occurred or is occurring among adults throughout the world; (2) this trend appears to be strongly related to lifestyle and socioeconomic change; and (3) the populations in developing countries, and the minority or disadvantaged communities in industrial countries, now face the greatest risk. Diabetes in adults should now be considered a problem not only in industrialized countries, but in developing countries as well. 4 figures, 21 references.

054

Epidemiological Correlates of NIDDM in Hispanics, Whites, and Blacks in the U.S. Population.

Form: Journal article.
Author: Harris, M.I.
Source: *Diabetes Care.*
14(7, Supplement 3):639-648, July 1991.

Abstract: Researchers investigated characteristics, prevalence, and risk factors for noninsulin dependent diabetes mellitus (NIDDM) among Hispanics, African Americans, and whites aged 20-74 years in the United States population using data from the Hispanic Health and Nutrition Examination Survey (HHANES) of 1982-1984 and the National Health and Nutrition Examination Survey of 1976-1980 (NHANES II). Both surveys used a household interview to ascertain diagnosed diabetes and a 75-gram, 2-hour oral glucose tolerance test (OGTT) to measure undiagnosed diabetes. HHANES studied Mexican Americans in the southwestern United States, Cuban Americans in the Miami, Florida, area, and Puerto Ricans in the New York City area. NHANES II examined a national sample of United States residents, of whom data on African Americans and whites were analyzed. Researchers developed stratified probability cluster samples for the three Hispanic groups in HHANES and the general population, including whites and African Americans in NHANES II, based on data from the U.S. Bureau of the Census. Survey participants were interviewed in their households to obtain demographic and other information including whether they had been diagnosed by a physician as having diabetes and what therapy they were using for their diabetes. Survey participants also received a physical examination and certain special clinical and laboratory tests. Individuals who reported a medical history of diabetes were considered to have diagnosed diabetes. In these studies, it was not possible to examine medical records for history of ketosis or other data to determine the participants' type of diabetes. Data were weighted by the probability of selection and participation of study participants at each of the survey sampling stages according to age, sex, Hispanic origin, race, and geographic location. People without a medical history of diabetes were further weighted by the probability of completion of an OGTT to represent the proportions of the Hispanic or United States populations without a medical history of diabetes. Age standardization was accomplished by the direct method with the United States population of 1978 as the standard. Data from NHANES II and HHANES indicate that characteristics of people with diabetes were similar among the five populations. Mean age at diagnosis for people with diagnosed diabetes was approximately equal, ranging from 45.2 years to 48.2 years. Mean duration of diabetes showed only a slight difference among the groups and ranged from 6.9 to 8.7 years. Age-standardized prevalence of diabetes (sum of diagnosed and undiagnosed cases) was 6.2 percent among whites, 9.3 percent among Cubans, 10.2 percent among African Americans, 13 percent among Mexicans, and 13.4 percent among Puerto Ricans. Age-standardized rates of impaired glucose tolerance were similar among the five populations. Increasing age, obesity, and family history of diabetes were associated with higher rates of diabetes but sex, physical activity, education, income, and acculturation were only weakly associated with diabetes prevalence. 6 figures, 7 tables, 44 references.

055

Ethnic Differences in Risk Factors Associated With the Prevalence of Non-Insulin-dependent Diabetes Mellitus: The San Luis Valley Diabetes Study.

Form: Journal article.
Author: Marshall, J.A.; Hamman, R.F.; Baxter, J.; Mayer, E.J.; Fulton, D.L.; Orleans, M.; Rewers, M.; Jones, R.H.
Source: *American Journal of Epidemiology.* 137(7):706-718, April 1, 1993.

Abstract: After obtaining informed consent for participation from each participant, researchers conducted a case-control study in two Colorado counties from 1984 to 1986 to determine whether known risk factors for noninsulin dependent diabetes mellitus (NIDDM) explained the increased incidence of the disease among Hispanics. Cases of diabetes mellitus were identified from medical records in all health care facilities in the San Luis Valley and by local publicity. Of 420 eligible persons with diabetes, 343 visited the clinic for an interview and examination. Of those who completed the process, 279 had confirmed NIDDM and were included in the study. Control persons without diabetes were selected using a geographically based two-stage sampling procedure. Researchers randomly selected an age, sex, ethnic group, and county-specific stratified sample of enumerated persons to reflect the age structure of the persons with diabetes. Eligible-control participants were aged 20-74 years and had never been told that they had diabetes. A total of 488 persons with normal glucose tolerance were eligible for analysis. The glucose tolerance status of the controls and participants with previously diagnosed diabetes was confirmed by a 75-gram oral glucose tolerance test. Hispanic ethnicity was defined by self-report to the 1980 Census question: Are you of Spanish or Hispanic origin or descent? Body mass index was calculated from measurements made with the person standing in light clothing without shoes. Skinfold measurements were made by the same observer twice per person at each of two body locations (subscapula and triceps); the results were then averaged. Central obesity was estimated as the ratio of subscapular skinfold to triceps skinfold. Skin reflectance, a marker for Amerindian admixture, was the weighted average of blue, green, and amber filter readings with a reflectance meter. Adjusted odds ratios were estimated by logistic regression using Generalized Linear Interactive Modeling (GLIM). The relation between each risk factor and diabetes was determined first by sex, adjusting for age and ethnicity, and then by ethnicity, adjusting for age and sex. Results showed that Hispanics were 3.5 times more likely than non-Hispanic whites to have NIDDM. The excess risks of diabetes associated with higher body mass index, higher subscapular and triceps skinfold thickness, family history of diabetes, and lower income were similar among Hispanics and non-Hispanic whites, after adjustment for age and sex. No association was found with skin reflectance. 5 tables, 75 references.

056

Excess Incidence of Known Non-Insulin-Dependent Diabetes Mellitus (NIDDM) in Hispanics Compared With Non-Hispanic Whites in the San Luis Valley, Colorado.

Form: Journal article.
Author: Baxter, J.; Hamman, R.F.; Lopez, T.K.; Marshall, J.A.; Hoag, S.; Swenson, C.J.
Source: *Ethnicity and Disease.* 3(1):11-21, Winter 1993.

Abstract: To determine whether the excess of noninsulin dependent diabetes mellitus (NIDDM) cases among Hispanic Americans is due to increased incidence, survivorship, or other factors, researchers examined incidence density rates of NIDDM in a rural population of Hispanic Americans in southwestern Colorado using a new clinical diagnosis method for NIDDM. Diagnostic criteria, which have undergone evolution, considerably affect the identification of patients with NIDDM. Such differences hamper comparisons of NIDDM incidence across studies, even within the same ethnic group. Individuals with NIDDM in the study area were identified through (1) a chart review of in all area practices and hospitals (1983 through 1988), (2) household enumeration of a random sample, (3) ongoing physician and other health care provider referral, (4) local media announcements, and (5) self-referral. Researchers determined a diagnosis of diabetes in individuals when the medical record had a clear mention of diabetes, insulin, or oral medication therapy consistent with diabetes and/or glucose results met the World Health Organization (WHO) criteria for diabetes. All eligible patients in the study area were invited to have a 75-g glucose tolerance test, following a fast of at least 8 hours duration, to confirm diabetes diagnosis according to WHO criteria; 83 percent were confirmed as having diabetes. Results of the test identified 215 persons with NIDDM in the study area over a 6-year period. Hispanics had higher rates of NIDDM in all age groups compared to non-Hispanic whites. The age and nonresponse adjusted rate ratio comparing Hispanics and non-Hispanic whites was 3.1, indicating a significant excess risk of diabetes incidence for the Hispanic population in southern Colorado. Peak age specific incidence among Hispanics occurred in persons 50 to 59 years old, a decade earlier than non-Hispanic whites. Excess NIDDM risk in Hispanics was greatest among younger individuals and declined with advancing age. Findings were consistent with data from the Mexican American population in Texas. 1 figure, 4 tables, 42 references.

057

Gastric Emptying in Mexican Americans Compared to Non-Hispanic Whites.

Form: Journal article.
Author: Schwartz, J.G.; McMahan, C.A.; Green, G.M.; Phillips, W.T.
Source: *Digestive Diseases and Sciences.* 40(3):624-630, March 1995.

Abstract: Researchers examined whether Mexican Americans without diabetes mellitus have a more rapid rate of gastric emptying than non-Hispanic whites without diabetes mellitus. Previous studies have shown that patients with recently diagnosed noninsulin dependent diabetes mellitus (NIDDM) have a more rapid gastric emptying rate of glucose solutions than matched control subjects. Local newspaper advertisements and flyers posted around the University of Texas Health Science Center were used to solicit volunteers. Individuals with known diabetes or impaired glucose tolerance diagnosed according to the criteria of the World Health Organization were excluded from study participation. The total study population included 36 Mexican Americans and 31 non-Hispanic whites (mean age 31.8 years, range 20-45 years). Participants were classified as Mexican American if they identified both parents and grandparents as Hispanic or Mexican American; participants were classified as non-Hispanic whites if they identified both parents and grandparents as white or Caucasian. All participants were nonsmokers who took no medication other than some vitamins and topical steroid creams. To measure gastric emptying, all participants drank a 50-gram solution of glucose in water after an overnight (12-15 hour) fast. Immediately after participants had finished drinking the solution, researchers began taking consecutive 1-minute gamma camera images in both the anterior and posterior body positions, continuing for 120 minutes. The resulting images of the stomach were used to determine the average caloric emptying rate for each participant. Participants' blood samples were used to measure plasma glucose levels, serum insulin levels, and plasma GIP levels just prior to the ingestion of the glucose solution and at 15-minute intervals throughout the 2-hour testing period. Data were analyzed using analysis of covariance. The resulting model included the effects of sex, ethnicity, the interaction of sex and ethnicity, age, and body mass index (BMI). Adjusting for age, sex, and BMI, the mean gastric half-emptying time was 56.5 minutes for Mexican Americans and 66.4 minutes for non-Hispanic whites (half-emptying time was the average emptying rate over the time required to empty 100 kcal of the 200 kcal glucose solution). This difference remained after adjusting for body weight. The higher the BMI, the faster the rate of gastric emptying. There were no statistically significant differences between the baseline glucose or insulin values due to either sex or ethnicity. The mean glucose concentrations, the mean serum insulin values, and the mean plasma GIP values over the 2-hour study period were higher, but not significantly, in the Mexican American participants. There was a significant association between age and GIP levels (the older the person, the higher the GIP level) and between sex and GIP levels (males have higher levels than females). Researchers suggest that rapid gastric emptying may play a role in the development of the diabetes among Mexican Americans. 1 figure, 3 tables, 27 references.

058

Higher Insulin and C-Peptide Concentrations in Hispanic Population at High Risk for NIDDM: San Luis Valley Diabetes Study.

Form: Journal article.
Author: Boyko, E.J.; Keane, E.M.; Marshall, J.A.; Hamman, R.F.
Source: *Diabetes.* 40(4):509-515, April 1991.

Abstract: Researchers compared fasting and glucose-stimulated insulin and C-peptide levels in a community-based sample of 464 Hispanic and 676 non-Hispanic white adult residents of the San Luis Valley of south central Colorado between May 1984 and August 1988. All 1,140 participants had normal glucose tolerance as confirmed by oral glucose tolerance testing (OGTT) interpreted with World Health Organization (WHO) criteria. Diabetes status was determined by a 75-g OGTT at the study clinic. Researchers administered a fasting blood test and drew blood again 1-2 hours after administration of the oral glucose load. They tested the blood for plasma glucose, serum insulin, and plasma C-peptide concentrations. Ethnicity was determined by self-report in the 1980 U.S. Census questions regarding Hispanic origin. Researchers also measured height, weight, waist and hip circumference, and calculated body mass index (BMI). Family history of diabetes mellitus was defined as positive if the participant reported diabetes mellitus in any parent or sibling. Results showed significantly higher mean fasting and 1- and 2-hour post-glucose load insulin levels in Hispanic versus non-Hispanic whites (fasting 0.08 versus 0.07 nM, p equal to 0.0026; 1h 0.52 versus 0.47 nM, p equal to 0.0129; 2h 0.36 versus 0.27 nM, p less than 0.0001), even after adjustment for age, sex, BMI, waist-hip ratio, family history of diabetes mellitus, concurrent plasma glucose level, and fasting insulin level. Mean fasting and 1- and 2-hour glucose-stimulated C-peptide levels in Hispanics also significantly exceeded those in non-Hispanic whites (fasting 0.58 versus 0.54 nM, p equal to 0.0119; 1h 2.72 versus 2.46 nM, p less than 0.0001; 2h 2.25 versus 1.97 nM, p less than 0.0001). The C-peptide-insulin molar ratio was greater in non-Hispanic whites than Hispanics at all times measured, from 7.4-14.2 percent. The lower levels of C-peptide compared with insulin in Hispanics suggest that the hyperinsulinemia seen in this ethnic group may be due in part to decreased hepatic insulin extraction. Results reveal that Hispanics with normal glucose tolerance have higher serum insulin levels than non-Hispanic whites. This suggests that Hispanics with normal glucose tolerance are more insulin-resistant on average than non-Hispanic whites. 3 tables, 35 references.

059

Incidence of NIDDM and Impaired Glucose Tolerance in Hypertensive Participants: The San Antonio Heart Study.

Form: Journal article.
Author: Morales, P.A.; Mitchell, B.D.; Valdez, R.A.; Hazuda, H.P.; Stern, M.P.; Haffner, S.M.
Source: *Diabetes.* 42(1):154-161, January 1993.

Abstract: Researchers examined the association of hypertension at baseline to the 8-year incidence of noninsulin dependent diabetes mellitus (NIDDM) and impaired glucose tolerance among 1,471 participants in the San Antonio (Texas) Heart Study. They also examined whether hypertensive patients taking thiazides or beta-blockers have an increased risk of NIDDM or impaired glucose tolerance relative to hypertensive patients not taking these agents. At a baseline examination, researchers made anthropometric measurements of participants' height, weight, subscapular and triceps skin folds, and calculated body mass index (BMI). Blood specimens were obtained after a 12-14 hour fast for determination of plasma glucose and serum insulin concentrations. A 75-gram glucose equivalent load was then administered, and blood specimens were obtained 1 and 2 hours later for plasma glucose determinations. At a home interview, researchers asked participants two hypertension-related questions: (1) Whether they had been previously diagnosed as hypertensive; and (2) if they were hypertensive, whether they were currently taking antihypertensive medication. The 8-year followup study began in October 1987. Vital status was ascertained on 97.8 percent of the originally enrolled participants. A total of 969 Mexican Americans and 704 non-Hispanic whites attended the followup examination. The medical examination was performed in a mobile clinic located in the participants' neighborhoods. All anthropometric, physiological, and biochemical measurements were made in a manner identical to that used at the baseline examination. Group means for baseline measurements were compared by using a one-way ANOVA with hypertension status at baseline as the grouping variable. A preliminary two-way ANOVA conducted with ethnicity and hypertension status at baseline as the grouping variables revealed that ethnicity and hypertension status were not statistically significant for any of the variables. Glucose and insulin concentrations and blood pressure were adjusted for age, sex, ethnicity, BMI, and central adiposity by ANCOVA. The incidence of NIDDM and impaired glucose tolerance were calculated according to hypertension status at baseline and selected risk factors. Participants who were hypertensive at baseline had a higher incidence of NIDDM and impaired glucose tolerance than those who were normotensive at baseline. After adjusting for age, sex, ethnicity, obesity, body fat distribution, fasting glucose, and insulin, this excess was eliminated for NIDDM but not for impaired glucose tolerance. 6 tables, 43 references.

060

Incidence of Type II Diabetes in Mexican Americans Predicted by Fasting Insulin and Glucose Levels, Obesity, and Body-Fat Distribution.

Form: Journal article.
Author: Haffner, S.M.; Stern, M.P.; Mitchell, B.D.; Hazuda, H.P.; Patterson, J.K.
Source: *Diabetes.* 39(3):283-288, March 1990.

Abstract: Researchers examined body mass index (BMI), ratio of subscapular-to-triceps skin fold (centrality index), and fasting glucose and insulin concentrations as predictors of decompensation to noninsulin dependent diabetes (type II diabetes) among Mexican Americans, a population at high risk for this disorder. They used data from the San Antonio Heart Study, a population-based study of diabetes and cardiovascular disease among Mexican Americans and non-Hispanic whites. From 1979 to 1982, they randomly sampled households from several San Antonio, Texas, census tracts: (1) Two low-income (barrio) tracts that were 96 percent Mexican American, (2) two middle-income tracts that were 52 percent Mexican American and 48 percent white, and (3) a cluster of suburban tracts that were 90 percent white. All men and nonpregnant women aged 25-64 years who were residing in the randomly selected households were eligible for the study. Participants received a home interview followed by a clinic examination. At baseline examination, blood specimens were obtained and anthropometric measurements were taken. Beginning in October 1987, researchers began an 8-year followup study to ascertain the incidence of type II diabetes and coronary heart disease. Vital status was ascertained on 98 percent of participants. The followup examination consisted of an initial home or telephone interview followed by a medical examination performed in a mobile clinic located in the participant's neighborhood. At the followup examination, plasma glucose was measured in the fasting state and 2 hours after the administration of a 75-gram glucose equivalent load. Diabetes mellitus was diagnosed according to the criteria of the World Health Organization (WHO). The methods used for glucose, insulin, and anthropometric measurements were identical with those used in the baseline examination. Age-adjusted group means for baseline variables were computed for participants who subsequently converted to diabetes and for those who remained free of disease by analysis of covariance. Multiple logistic regression analysis was used to estimate the odds ratio associated with each risk factor adjusted for all other risk factors. Twenty-eight of 474 Mexican Americans initially without diabetes developed type II diabetes after 8 years of followup. Converters to diabetes were older and had higher BMI's, centrality indexes, and fasting glucose and insulin concentrations than nonconverters. 4 tables, 40 references.

061

Increased Incidence of Type II Diabetes Mellitus in Mexican Americans.

Form: Journal article.
Author: Haffner, S.M.; Hazuda, H.P.; Mitchell, B.D.; Patterson, J.K.; Stern, M.P.
Source: *Diabetes Care.* 14(2):102-108, February 1991.

Abstract: Researchers sought to determine whether Mexican Americans have an increased incidence of noninsulin dependent (type II) diabetes mellitus relative to non-Hispanic whites. They determined the 8-year incidence of type II diabetes among 617 Mexican Americans and 306 non-Hispanic whites who participated in the San Antonio Heart Study, a population-based study of diabetes and cardiovascular disease. They also examined the relationship of diabetes incidence to age, sex, obesity, and educational attainment and attempted to ascertain whether ethnic differences in these risk factors account for the ethnic differences in diabetes incidence. The 8-year followup study began in October 1987 and it included Mexican Americans and whites from four San Antonio, Texas, census tracts: (1) Two low-income census tracts, (2) one middle-income census tract, and (3) one upper-income census tract. The followup examination consisted of a home or telephone interview followed by a medical examination performed in a mobile clinic located in the participant's neighborhood. Plasma glucose was measured in the fasting state and 2 hours after administration of a 75 gram glucose-equivalent load. The methods used for glucose and anthropometric measurements were identical with those used at baseline examination.

Diabetes mellitus was diagnosed according to the criteria of the World Health Organization (WHO). Ethnic-specific means for continuous variables were computed for participants who converted to diabetes and those who remained free of disease by two-way analysis of variance. Ethnic differences in diabetes incidence stratified by age, sex, level of education, and obesity were evaluated by the Mantel-Haenszel procedure. Multiple logistic regression analysis was used to estimate the odds ratio associated with each risk factor adjusted with all other risk factors. Body mass index was categorized into tertiles. The study found that Mexican Americans continue to show a statistically significant increase in diabetes incidence. Obesity and age were also positively related to diabetes incidence in this analysis. Participants with at least some college education had a lower incidence of diabetes than those with less than a high school education. The incidence of type II diabetes among Mexican Americans is greater than that among non-Hispanic whites, a difference that is not explained by ethnic differences in obesity, age, or level of educational attainment. 5 tables, 35 references.

062

Invited Commentary: Do Risk Factors Explain Ethnic Differences in Type II Diabetes?

Form: Journal article.
Author: Stern, M.P.
Source: *American Journal of Epidemiology.* 137(7):733-734, April 1, 1993.

Abstract: A researcher explores whether risk factors explain ethnic differences in noninsulin dependent (type II) diabetes mellitus. The researcher cites two examples of this analytic strategy: (1) Marshall et al. document a greater prevalence of noninsulin dependent diabetes among Hispanic than among non-Hispanic whites living in the San Luis Valley in southern Colorado; and (2) Cowie et al. document a similarly-elevated prevalence of diabetes in African Americans as compared with whites, as examined in the Second National Health and Nutrition Examination Survey. These differences were especially marked in obese women. Both studies had major strengths: They (1) were population-based, (2) were carefully-designed and executed, (3) diagnosed diabetes on the basis of a standard oral glucose tolerance test using standardized criteria, and (4) used sophisticated statistical techniques to address the central question posed. Risk factors examined in the two studies included age, sex, obesity, body fat distribution, family history of diabetes, and socioeconomic status. Once the conventional risk factors have been accounted for, however, what explains the excess risk in African Americans and Hispanics? The limitations of these studies come primarily from the relatively crude techniques currently available for measuring risk factors. If the technique for measuring a risk factor has poor validity or low precision, the risk factor might appear to explain less of the ethnic or racial difference than it actually does. Family history and socioeconomic status, for example, are often used as indicators of genetic factors and environmental factors, respectively. However, neither is a pure measure of either of these constructs, as researchers know. Clearly, researchers need to develop more precise methods for specifying risk factors and exposure variables. Although evidence exists that skin reflectance, the technique employed by Marshall et al., provides a reasonable measure of genetic admixture in certain populations, admixture estimates lack precision for specifying the admixture of individuals. This may explain Marshall et al.'s finding that admixture differences between men who have diabetes and men who do not have diabetes (but not women) were the opposite of that expected. Advances in molecular genetics offer hope of quantifying the genetic susceptibility of an individual to noninsulin dependent (type II) diabetes. Until scientists discover one or more truly new environmental risk factors, researchers cannot completely account for population differences in diabetes rates by assessing differences in risk factors. 2 references.

063

Longitudinal Prospective Study Among Puerto Rican Diabetic Patients.

Form: Journal article.
Author: Aguilo, F.; Allende, M.Z.; Altieri, P.I.
Source: *Boletin. Asociacion Medica de Puerto Rico.* 77(11):464-470, November 1985.

Abstract: The University Group Diabetes Program (UGDP) conducted a study to determine the relationship between type of therapy and appearance of diabetes complications. Conducted over a 14-year period ending in 1978, researchers sought to determine the degree of correlation between tight metabolic control (IVAR, or insulin variable) and not so rigid type of therapy (PLBO, or placebo groups). The latter group took diet and pills made to resemble either tolbutamide (TOLB) or phenformin (PHEN). The unexpected appearance of a higher cardiovascular mortality among the TOLB and PHEN treated groups brought such therapy to a halt. Participants for the study included 34 persons with noninsulin dependent diabetes (NIDDM) (23 females, 11 males) aged 46-80 years. The persons had been diagnosed within the year of their inclusion into the UGDP study, having fulfilled the criterion of being able to stay free of ketonuria during a 1-month observation period. Physicians conducted quarterly examinations for detection of complications of diabetes such as neuropathy, peripherovascular disease, and retinopathy. The study included a detailed history taking of recognized risk factors for coronary artery disease (CAD) such as smoking, obesity, and arterial hypertension. A positive history for smoking meant having smoked cigarettes habitually at any time in their life. Obesity was defined as an increase in body weight 20 percent above the ideal body weight for heights as given by 1959 Metropolitan Life Insurance Tables. Hypertension meant three or more determinations during which blood pressure was 160 systolic and 95 mm Hg diastolic or above, while off diuretics or other antihypertensive therapy. At the conclusion of the UGDP study, no clear-cut results had emerged in regards to type of metabolic control and long-term complications. There was no improvement in control by switching all other persons to IVAR after termination of the UGDP protocol. Of 16 persons (12 females and 4 males) who had both an abnormal electrocardiogram (ECG) and vectorcardiography (VCG), one changed the ECG-VCG pattern from that of equally inscribed ST-T loop to a pattern of myocardial infarction. This person also developed clinical symptoms of CAD. Five persons changed from initially normal to abnormal ECG-VCG. The age, sex, degree of hypertension, and smoking history of the people who remained with normal ECG-VCG did not significantly differ from those who changed. 2 figures, 4 tables, 28 references.

064

Methods and Prevalence of Non-Insulin-Dependent Diabetes Mellitus in a Biethnic Colorado Population: The San Luis Valley Diabetes Study.

Form: Journal article.
Author: Hamman, R.F.; Marshall, J.A.; Baxter, J.; Kahn, L.B.; Mayer, E.J.; Orleans, M.; Murphy, J.R.; Lezotte, D.C.
Source: *American Journal of Epidemiology.* 129(2):295-311, February 1989.

Abstract: Researchers present prevalence estimates for noninsulin dependent diabetes mellitus (NIDDM) in Hispanic and Anglo persons who participated in the San Luis Valley Diabetes Study. Conducted in two southern Colorado counties whose populations include

43.6 percent Hispanics and 54.9 percent Anglos, the San Luis Valley Diabetes Study was undertaken to determine the prevalence, risk factors, and complications of NIDDM in Hispanics and Anglos using a geographically based case-control design. Researchers identified persons with diabetes by chart review of medical records in all health care facilities in the area (i.e., two hospitals, three group practices, and two solo practices). Additional persons with diabetes were recruited through responses to advertisements in local newspapers, presentations to local organizations, and local radio programs. Researchers identified controls without diabetes by a two-stage random sample of households. A total of 343 persons with diabetes and 607 controls attended a clinic where an oral glucose tolerance test or current hypoglycemic therapy confirmed or diagnosed NIDDM. Clinic visits included (1) provision of informed consent for all studies; (2) measurement of height and weight; (3) interviews about sociodemographic factors, family history, diet, physical activity, and medical and drug use history; and (4) screening examinations for cardiovascular system problems, peripheral neuropathy, peripheral vascular disease, and retinopathy. Ethnicity (Hispanic and Anglo) was defined by the self-report of participants to the question: Are you of Hispanic or Spanish origin or descent? Participants reporting yes were classified as Hispanic, while those reporting no were considered Anglo. The age-adjusted prevalence of confirmed NIDDM was 21 per 1,000 in Anglo males and 44 per 1,000 in Hispanic males, accounting for nonresponse. For Anglo females, the prevalence was 13 per 1,000 compared with 62 per 1,000 for Hispanic females, accounting for nonresponse. 4 figures, 7 tables, 41 references.

065

Mortality of Mexican Americans With NIDDM: Retinopathy and Other Predictors in Starr County, Texas.

Form: Journal article.
Author: Hanis, C.L.; Chu, H.H.; Lawson, K.; Hewett-Emmett, D.; Barton, S.A.; Schull, W.J.; Garcia, C.A.
Source: *Diabetes Care.* 16(1):82-89, January 1993.

Abstract: Researchers conducted a study to determine the rate and risk factors of mortality in a cohort of Mexican Americans with noninsulin dependent diabetes mellitus (NIDDM). They identified 353 Mexican Americans with NIDDM from two screening programs conducted between 1981-1983 and 1984-1986. The screening programs involved classification of diabetes among blocks of people randomly selected from each of three main communities in Starr County in proportion to town size. All individuals in each dwelling unit over age 14 years were screened for diabetes based on (1) previous diagnosis and current treatment, (2) a series of blood glucose determinations, or (3) oral glucose tolerance tests. In the fall of 1986, researchers enrolled 360 individuals from the 2 programs in a prospective investigation of the development of complications of diabetes. Reevaluations began in January 1987 and consisted of a series of complete annual examinations including fundus photography and intermediate in-home evaluations. By means of the annual examinations, researchers sought to characterize the health status of all participants. Through the intermediate examinations, researchers aimed to provide a near-continuous picture of metabolic control. Of these 360 individuals, researchers classified 7 as having insulin dependent diabetes mellitus (IDDM) and excluded them from further data analyses. Researchers followed the cohort of 353 individuals with NIDDM (222 women and 131 men) prospectively for an average of 8 years. They updated the mortality status of the cohort through interviews, telephone conversations, obituary reviews, and reviews of death certificates. For each mortality event, researchers extracted all primary and secondary causes of death from available death certificates. Researchers used various statistical techniques to determine those factors predictive of subsequent mortality. These ranged from calculation of risk ratios to analysis of survival times with covariates that used proportional hazards regression models. Because of apparent differences by sex, researchers conducted most analyses separately for men and women. In all instances, age was included in the proportional hazard models as a covariate. Estimates of survival curves among retinopathy groups were obtained by using the nonparametric Kaplan-Meier method. ANCOVA techniques were used to determine the significance between mean differences in putative risk factors among survival classifications. All analyses were performed as implemented in STATA. The cohort experienced 67 mortality events (30 women, 37 men). One-third of all deaths were premature (less than age 65 years) and most (60 percent) were attributed to coronary heart disease. Diabetes was not listed as the cause of death in any of the cases, although it was listed as a contributing cause in 25.5 percent of cases. For both sexes, results identified baseline retinopathy as an important predictor of subsequent mortality. 3 figures, 4 tables, 34 references.

066

Prevalence Rates for Diabetes Mellitus in Puerto Rico.

Form: Journal article.
Author: Haddock, L.; de Conty, I.T.
Source: *Diabetes Care.*
14(7, Supplement 3):676-684, July 1991.

Abstract: Researchers analyzed prevalence data obtained from the Household Health Interview Survey for diabetes mellitus by sex and age for the years 1981, 1984, 1985, and 1986. This continuous household study, conducted by the Department of Health of the Commonwealth of Puerto Rico, collects health information related to the patterns of use of medical services. It also measures the acute and chronic morbidity that prevails in the population in a certain period of time and allows investigators to include supplementary questionnaires on health issues of interest to them. Every 3 months, researchers survey approximately 750 households with approximately 4 people per household. Researchers make comparisons between the prevalence of diabetes in Puerto Rico with that in two Mexican communities. In 1981, researchers interviewed a sample of 5,590 people; in 1984, 6,379 people; in 1985, 7,966 people; and in 1986, 7,721 people. Researchers asked participants if anyone in their family had diabetes. Prevalence rates were based on household interview surveys at 6 and 9 months. They obtained the prevalence rate by dividing the estimated population with diabetes by the total population and, in the case of various age groups and sex, by dividing the respective population with diabetes by the population in that given age group or sex. The mean prevalence rate of known cases of diabetes increased from 3.1 percent in 1975 to 5.1 percent in 1986. Researchers found that, although the mean rate for 1986 was 5.1 percent, 16 percent higher than that of 1981, the age- and sex-adjusted rate for 1986 was 4.8 percent, 9 percent higher than the 1981 rate. Researchers also analyzed the prevalence rates for 1985 by age group, sex, and geographic zones. The prevalence rate was significantly higher (p equal to 0.05) in the rural population for the age group 45-64 years and in the urban population for those over age 65 years. The chi-square was significantly different in the urban versus rural male population in the group aged over 65 years, but was not significantly different for any of the female age groups. On the basis of the prevalence data, researchers calculate that approximately 90 percent of the population with diabetes are noninsulin dependent and 10 percent are insulin dependent. Major risk factors thought to explain the increased prevalence of noninsulin dependent diabetes include the increasing longevity of the Puerto Rican population, genetic predisposition, obesity, and changes in lifestyle. 12 tables, 17 references.

067

Prevalence and Risk Factors of Diabetic Retinopathy in Non-Hispanic Whites and Hispanics With NIDDM: San Luis Valley Diabetes Study.

Form: Journal article.
Author: Hamman, R.F.; Mayer, E.J.; Moo-Young, G.A.; Hildebrandt, W.; Marshall, J.A.; Baxter, J.
Source: *Diabetes.* 38(10):1231-1237, October 1989.

Abstract: Researchers compared the prevalence of diabetic retinopathy between non-Hispanic whites and Hispanics in the San Luis Valley (Colorado) Diabetes Study to determine whether Hispanics in southern Colorado constituted a high-risk group for diabetic retinopathy. Use of standardized methods enabled comparisons with prevalence data from the San Antonio Heart Study and the Wisconsin Epidemiologic Study of Diabetic Retinopathy. The study also investigated other potential risk factors and explored whether the impact of these factors on diabetic retinopathy differed between Hispanics and non-Hispanic whites. After pharmacological dilation of pupils, stereoscopic fundus photographs were taken of Diabetic Retinopathy Study fields one, two, and four. Photographs were graded at the University of Wisconsin Fundus Photography Reading Center with the modified Airlie House criteria. A table presents the classification scheme for assigning severity of retinopathy. The condition of the worse eye determined the retinopathy level for each patient. In the absence of photographs, ophthalmologists' medical records were reviewed and were used to classify retinopathy if photocoagulation treatment for retinopathy was recorded or specific lesions were identified within 6 months before a visit to the San Luis Valley Diabetes Study clinic. Among the participants with diabetes, 88.8 percent of the Hispanics and 92.4 percent of the non-Hispanic whites were classified by retinopathy status. The remaining participants, whose retinopathy status was undetermined, either refused photographs, had ungradable photographs, or had no ophthalmologic medical record available. The duration-adjusted prevalence of any diabetic retinopathy was 41.8 percent in Hispanics and 54.1 percent in non-Hispanic whites. Severe diabetic retinopathy occurred in 18.5 percent of the Hispanics and in 21.3 percent of the non-Hispanic whites. 1 figure, 4 tables, 32 references.

068

Prevalence of Diabetes in Mexican Americans, Cubans, and Puerto Ricans From the Hispanic Health and Nutrition Examination Survey, 1982-1984.

Form: Journal article.
Author: Flegal, K.M.; Ezzati, T.M.; Harris, M.I.; Haynes, S.G.; Juarez, R.Z.; Knowler, W.C.; Perez-Stable, E.J.; Stern, M.P.
Source: *Diabetes Care.* 14(7, Supplement 3):628-638, July 1991.

Abstract: Using data from the Hispanic Health and Nutrition Examination Survey (HHANES), a multipurpose cross-sectional study conducted in 1982-84, researchers conducted a study to estimate the prevalence of diagnosed and undiagnosed diabetes among Mexican Americans, Cubans, and Puerto Ricans in the United States and to compare these estimates to data from prior surveys for non-Hispanic whites and African Americans. Researchers also estimated the United States non-Hispanic white and African American populations from the

Second National Health and Nutrition Examination Survey (NHANES II). The diabetes component of the HHANES consisted of interview questions on diabetes diagnosis and treatment and an oral glucose tolerance test (OGTT) administered to a subsample. The interviewed sample included 3,935 Mexican Americans in the Southwest; 1,134 Cubans in Florida; and 1,519 Puerto Ricans in the New York City area. Persons who reported that a doctor had told them they had diabetes were classified as having previously diagnosed diabetes. Researchers further classified respondents with no history of previously diagnosed diabetes on the basis of results from the glucose tolerance test and criteria from the World Health Organization (WHO) and the National Diabetes Data Group (NDDG). They diagnosed respondents as having undiagnosed diabetes, impaired glucose tolerance, or neither. For the analyses presented here, participants who fasted between 9 and 17 hours were considered to have valid OGTT's. Researchers used 2-hour values from blood samples taken within 105-135 minutes after drinking Glucola. Researchers estimated and tested subpopulation, age, and sex effects in the context of an overall statistical model. Statistical procedures involving weighted analyses of these data, with appropriate adjustments for the complex survey design, were implemented with SAS, SURREGR, SESUDAAN, and GENCAT. Results showed that the weighted prevalence of undiagnosed diabetes was two times greater for Mexican Americans (11.4 percent) and Puerto Ricans (13.9 percent) than for non-Hispanic whites (6.8 percent). In men and women aged 45-74 years, the weighted total prevalence of diabetes was extremely high for both Mexican Americans (23.9 percent) and Puerto Ricans (26.1 percent) compared with Cubans (15.8 percent) or non-Hispanic whites (12 percent). The total prevalence of diabetes was not significantly different for Mexican Americans (27.7 percent) and Puerto Ricans (30.2 percent) but was significantly lower for Cubans (18.2 percent). An appendix describes the methods used to estimate prevalence. 8 tables, 30 references.

069

Prevalence of Diabetes in Mexican Americans: Relationship to Percent of Gene Pool Derived From Native American Sources.

Form: Journal article.
Author: Gardner, L.I.; Stern, M.P.; Haffner, S.M.; Gaskill, S.P.; Hazuda, H.P.; Relethford, J.H.; Eifler, C.W.
Source: *Diabetes.* 33(1):86-92, January 1984.

Abstract: Researchers sought to determine the prevalence of noninsulin dependent diabetes mellitus (NIDDM) in Mexican Americans and Anglos in three San Antonio neighborhoods. The study group included persons aged 25-64 years who were randomly selected from three San Antonio neighborhoods: (1) A low-income census tract in an almost exclusively Mexican American neighborhood (barrio), (2) a middle-income census tract (transitional) that is 60 percent Mexican American and 40 percent Anglo American, and (3) a cluster of high-income census tracts (suburbs) that is 90 percent Anglo American and 10 percent Mexican American. Only Mexican Americans were sampled in the barrio and approximately equal numbers of each ethnic group were sampled in each of the other neighborhoods. The study design included an initial home interview followed by a medical examination in a mobile clinic. Researchers conducted field work from October 1979 to August 1981. They accomplished ethnic classification using a multifactorial approach. The initial consideration of ethnic classification was concordance between the surname (Spanish versus non-Spanish) of the person's father and the maiden name of the person's mother. Researchers screened Spanish parental surnames and weeded out non-Mexican Latino (e.g., Central and South American) and discordant (one Spanish and one non-Spanish) parental surnames to arrive at a group of persons who had at least three Mexican grandparents. Also performed were anthropometric measurements for stature, weight, and triceps and subscapular skinfolds thickness; and plasma glucose samples drawn after the participant had fasted at least 12 hours. Diabetes was diagnosed according to the criteria established by the National Diabetes Data Group (NDDG). Skin color was measured by light reflectance using a portable spectrophotometer. The calculation of Native American genetic admixture is based on Bernstein's equation using skin color. Age adjustment of sum of skinfolds, glucose sum, and skin reflectance values was carried out separately for each sex by analysis of covariance using Biomedical Computer Program PIV, 1979 release. The prevalence of NIDDM for the San Antonio subgroups, for Pima Indians, and for the HANES II population were directly age-standardized to the 1970 United States population. The age-adjusted NIDDM rates for both sexes among Mexican Americans were 14.5 percent for residents of the low-income barrio, 10 percent for residents of the middle-income transitional neighborhood, and 5 percent for residents of the high-income suburbs. The percent Native American admixture of Mexican American as estimated from skin color measurements was 46 percent in the barrio, 27 percent in the transitional neighborhood, and 18 percent in the suburbs. The NIDDM rates in Mexican Americans paralleled the proportion of Native American genes. The association of genetic admixture rates suggests that much of the epidemic of NIDDM among Mexican Americans is confined to that part of the population with a substantial Native American heritage. 2 figures, 3 tables, 28 references.

070

Prevalence of Selected Chronic Diseases Among the Mexican-American Elderly: Data From the 1982-1984 Hispanic Health and Nutrition Examination Survey.

Form: Journal article.
Author: Espino, D.V.; Burge, S.K.; Moreno, C.A.
Source: *Journal of the American Board of Family Practice.* 4(4):217-222, July-August 1991.

Abstract: Researchers reviewed data based on physical examinations of three groups of older Mexican Americans residing in the southwest from the 1982-1984 Hispanic Health and Nutrition Examination Survey (HHANES) to determine rates of hypertension, diabetes mellitus, arthritis, and heart disease. The HHANES is a four-stage cluster sample study that surveyed the health and nutritional status of Hispanics in the United States. For the current study, researchers evaluated data only on Mexican Americans living in Arizona, California, Colorado, New Mexico, and Texas. Demographic, socioeconomic, and health-related information was collected from 7,462 Mexican Americans. Researchers divided the sample into three age groups: 45-54 years, 55-64 years, and 65-74 years. Each group was examined for the presence of arthritis, hypertension, diabetes mellitus, and heart disease. The category of heart disease included hypertensive heart disease, heart failure, ischemic heart disease, rheumatic heart disorders, and other forms of heart disease that were diagnosed by the survey team's physicians following a complete medical history and physical examination. A diagnosis of diabetes mellitus was based on an extensive medical history review, statement of health care needs, laboratory results, and the physicians' diagnostic impression based on physical examination. Researchers stratified each age group using the HHANES poverty index to control for the effects of socioeconomic status. Chi-square analysis was used to compare prevalences of disease among the three age groups in order to determine whether the trends observed were consistent throughout the groups. Data derived from HHANES were compared with national morbidity data from the 1983-1985 National Health Interview Study (NHIS) on the four selected chronic diseases. All analyses were performed using the SPSS and Super CARP programs on a mainframe computer. The final sample included 1,286 Mexican Americans aged 45-74 years. The majority were women (54.7 percent), married (74 percent), and born in the United States (59.7 percent). The prevalence of all chronic disease entities measured showed an age-associated increase. There was a two-fold greater increase in the prevalence of diabetes between the age group 45-54 years and the age group 55-64 years. Hypertension and arthritis showed similar trends, but researchers did not note an age-associated rise in heart disease until the age group 65-74 years. No significant differences were noted in disease prevalence in any age group when controlling for poverty level. Both the younger and older groups of Mexican Americans had higher proportions of diabetes mellitus and lower proportions of hypertension, arthritis, and heart disease when compared with the general population. 3 tables, 33 references.

071

Proinsulin and Specific Insulin Concentration in High- and Low-Risk Populations for NIDDM.

Form: Journal article.
Author: Haffner, S.M.; Bowsher, R.R.; Mykkanen, L.; Hazuda, H.P.; Mitchell, B.D.; Valdez, R.A.; Gingerich, R.; Monterossa, A.; Stern, M.P.
Source: *Diabetes.* 43(12):1490-1493, December 1994.

Abstract: Researchers examined proinsulin, insulin, and the fasting proinsulin to insulin ratio in 206 Mexican Americans without diabetes mellitus and 123 non-Hispanic whites without diabetes mellitus. Data came from the San Antonio (Texas) Heart Study, a population-based study of diabetes and cardiovascular disease that was conducted in two phases. During phase two followup, researchers measured serum insulin concentrations in the study participants using a commercial double antibody radioimmunoassay in which proinsulin cross-reactivity was less than 0.2 percent. Diabetes and impaired glucose tolerance (IGT) were diagnosed according to World Health Organization criteria. Researchers conducted statistical analysis on the data using two-way analysis of covariance, with ethnic classification as the principal independent variable of interest. Results showed that the Mexican Americans were younger, more obese, and had higher fasting and 2-hour specific insulin and proinsulin concentrations compared to non-Hispanic whites. There was no significant ethnic difference in waist-to-hip ratio (WHR), fasting or 2-hour glucose, fasting proinsulin to insulin ratio, or the percentage of participants with IGT. Men had significantly higher WHR, lower 2-hour glucose, and lower percentage of IGT cases than women. There was no sex difference in age, body mass index (BMI), fasting glucose, fasting and 2-hour insulin and proinsulin concentrations, or the fasting proinsulin to insulin ratio. The fasting proinsulin to insulin ratio was higher in 85 participants with noninsulin dependent diabetes mellitus (NIDDM) compared with participants with IGT or normal glucose tolerance. Persons without diabetes from a high-risk population for NIDDM are hyperinsulinemic and do not secrete more proinsulin relative to insulin than do persons without diabetes. 2 figures, 2 tables, 29 references.

072

Recent Developments in the Epidemiology of Diabetes in the Americas.

Form: Journal article.
Author: Mitchell, B.D.; Stern, M.P.
Source: *World Health Statistics Quarterly.* 45(4):347-349, 1992.

Abstract: Researchers briefly summarize the major findings of several surveys on diabetes mellitus prevalence in North and South America. The overwhelming proportion of diabetes in the Americas is Type 2, or noninsulin dependent diabetes mellitus (NIDDM). The prevalence of NIDDM ranges broadly according to ethnic group from less than 1 percent in the rural Mapuche Indians over 20 years of age in Chile to almost 50 percent in the Pima Indians over 20 years of age in the United States. According to the World Health Organization diagnostic criteria, the prevalence of NIDDM is approximately 2.5 times higher in Mexican Americans than in non-Hispanic whites. Among Mexican Americans, NIDDM follows a sociocultural gradient, with prevalence ranging from 16 percent in low-income barrios, to approximately 10 percent in middle-class neighborhoods, to 5 percent in high-income neighborhoods in San Antonio, Texas. Data from the Hispanic Health and Nutrition Examination Survey (HHANES) indicate prevalence of diabetes in the age range 45-74 years as 24 percent for Mexican Americans living in the southwestern United States, 26 percent for Puerto Ricans living in New York, and 16 percent for Cuban Americans living in Florida, compared to 12 percent for non-Hispanic whites. In a study comparing Mexican Americans of similar age residing in low-income areas of San Antonio, Texas, and Mexico City, Mexico, results indicate a 36 percent lower prevalence of diabetes in Mexico City than in San Antonio. African Americans also appear to have a relatively high prevalence of NIDDM, although not as high as Mexican Americans. One study found that 9.9 percent of African Americans aged 20-74 years had NIDDM, compared to 6.4 percent of whites in the same age group. In a recent survey conducted in Brazil, researchers found that diabetes prevalence was lowest among native Brazilian Indians (less than 2 percent) and highest in the most industrialized areas (where prevalences were similar for African Americans and whites, ranging from 6.6 to 7.0 percent). There is some evidence that the long-term health effects of diabetes, like prevalence, may differ among different populations. Diabetes appears to have particularly severe consequences for at least some Mexican American populations, including microvascular complications, retinopathy, proteinuria, and microalbuminuria. African Americans are also at a higher risk than whites for a variety of diabetes complications, including macrovascular disease, end-stage renal disease, and retinopathy. 19 references.

073

Relationship of Prevalence of Non-Insulin-Dependent Diabetes Mellitus to Amerindian Admixture in the Mexican Americans of San Antonio, Texas.

Form: Journal article.
Author: Chakraborty, R.; Ferrell, R.E.; Stern, M.P.; Haffner, S.M.; Hazuda, H.P.; Rosenthal, M.
Source: *Genetic Epidemiology.* 3(6):435-454, 1986.

Abstract: Researchers conducted a genetic and epidemiological survey of noninsulin dependent diabetes mellitus (NIDDM) among the Mexican Americans residing in three socioeconomically distinct areas of San Antonio, Texas. Used as a surrogate for measures of socioeconomic and cultural status, the three survey areas included (1) a low socioeconomic traditional area (barrio); (2) a middle income, ethnically balanced area (transitional); and (3) a high income, predominantly Anglo area (suburb). Researchers used 17 polymorphic markers to relate the prevalences of NIDDM with the extent of Amerindian ancestry of 1,237 Mexican Americans from these 3 residential areas. These individuals were assigned one of three classifications on the basis of a glucose tolerance test: (1) Diabetic, according to the National Diabetes Data Group (NDDG) criteria as modified for epidemiologic surveys; (2) control individuals who had normal glucose tolerance and had no family history of diabetes; and (3) intermediate individuals who did not meet the NDDG criteria, but who had either impaired glucose tolerance or had a positive personal or family history of diabetes. An admixture analysis was performed to estimate the proportion of Amerindian genes in these gene pools, and its relationship with NIDDM prevalence was studied. A hierarchical gene diversity analysis was performed to examine whether the differences in the genetic profiles of Mexican Americans of San Antonio varied along the dimension of socioeconomic status or if its affinity was more toward the diabetes status of the individuals. While only the RH and haptoglobin loci showed evidence of association with NIDDM, an admixture analysis of the combined allele frequency data revealed a pattern of decreasing NIDDM prevalence with increasing socioeconomic status and a parallel decrease in Amerindian ancestry. 2 figures, 7 tables, 40 references.

074

Self-Reported Diabetes in Mexican Americans: HHANES 1982-84.

Form: Journal article.
Author: Perez-Stable, E.J.; McMillen, M.M.; Harris, M.I.; Juarez, R.Z.; Knowler, W.C.; Stern, M.P.; Haynes, S.G.
Source: *American Journal of Public Health.* 79(6):770-772, June 1989.

Abstract: Researchers present data on self-reported diabetes from the Hispanic Health and Nutrition Examination Survey (HHANES) and compare them with data from the second National Health and Nutrition Examination Survey (NHANES II). HHANES, which was conducted in Arizona, California, Colorado, New Mexico, and Texas between 1982 and 1984, used a sample of the civilian, noninstitutionalized Mexican origin population. A total of 4,735 Mexican Americans aged 20-74 years were selected for the HHANES survey, with 3,928 (83 percent) completing the diabetes section of the household questionnaire. Trained bilingual interviewers used either English or Spanish questionnaires to conduct interviews in the person's household. Mexican Americans aged 20-70 years were asked if they had diabetes or sugar diabetes. If they answered yes, they were asked if a doctor told them they had it. Persons who responded yes to both questions were defined as having self-reported diabetes. Respondents had a mean age of 36 years and were evenly divided between the sexes; 64 percent were born in the United States. The comparison population from NHANES II consisted of 17,390 selected noninstitutionalized civilians aged 20-74 years, of whom 15,357 (88.3 percent) completed the diabetes questionnaire. Age adjustment was carried out by means of direct standardization, using the U.S. Census population as the standard. Standard errors of age-adjusted rates were estimated using

SESUDAAN. Association of self-reported diabetes with education, income, and acculturation were tested by multidimensional contingency table chi-square analysis, controlling for age and sex. According to HHANES results, the age-adjusted prevalence rate for self-reported diabetes among Mexican Americans aged 20-74 years was 6.8 percent among men and 7.6 percent among women. Comparable rates for the United States population measured in NHANES II were 2.9 percent for men and 3.8 percent for women. In comparison with NHANES II reported rates for each age group, self-reported diabetes was 2-3 times as prevalent for Mexican American men and women. The prevalence of self-reported diabetes among Mexican Americans was greater among the older age groups of both sexes, as it was in the general United States population. Family income was not associated with self-reported diabetes among either sex. 2 tables, 23 references.

See also 011, 031, 040

Defining the Burden: Sizing the Problem of Diabetes Among Hispanics/Latinos

Descriptions of diabetes morbidity and/or mortality among Hispanics/Latinos

Gestational diabetes

075

Diabetes in Pregnancy in Mexican Americans.

Form: Journal article.
Author: Hollingsworth, D.R.; Vaucher, Y.; Yamamoto, T.R.
Source: *Diabetes Care.*
14(7, Supplement 3):695-705, July 1991.

Abstract: Using data from the University of California, San Diego (UCSD) Medical Center, which has had a Diabetes in Pregnancy Clinic since 1978, researchers describe their experience with pregnant Mexican-American women who have predominantly noninsulin dependent (type II) diabetes (NIDDM) and gestational diabetes mellitus (GDM). Patients are from a low-socioeconomic group and are referred from primary care obstetric clinics, other physicians, or the American Diabetes Association. Routine screening for GDM by a 50-gram glucose loading test given at random was performed at 24-28 weeks of gestation in all UCSD primary care obstetric clinics and satellite community clinics participating in a comprehensive perinatal project. Patients with abnormal screening and 3-hour oral glucose tolerance tests were tentatively classified as GDM during pregnancy and reclassified 6 weeks after delivery. From 1986 through 1988, 7,895 live-born infants were delivered at UCSD and 143 or 1.8 percent had mothers with diabetes. At UCSD, 66 percent of NIDDM and 51 percent of GDM patients have been of Mexican-American descent, since 1986. Mexican-American obese mothers with GDM had more frequent cesarean sections and were more likely to have complications of premature rupture of membranes and preterm labor. Polycythemia and sepsis also occurred more often among their infants. Anthropometric measurements among infants of both lean and obese mothers with GDM differed from those of infants of mothers without GDM. Infants of lean mothers with GDM were heavier and longer than those of lean mothers without GDM. In addition, they had increased waist-hip ratio and triceps and subscapular skin folds. Infants of obese mothers with GDM were heavier than infants of lean mothers with GDM. 4 figures, 7 tables, 25 references.

076

Gestational Diabetes Mellitus: Influence of Race on Disease Prevalence and Perinatal Outcome in a U.S. Population.

Form: Journal article.
Author: Dooley, S.L.; Metzger, B.E.; Cho, N.H.
Source: *Diabetes.* 40(Supplement 2):25-29, December 1991.

Abstract: Researchers explored whether racial differences influence disease prevalence and perinatal outcome in gestational diabetes mellitus (GDM). Data came from a population of 3,744 consecutive patients with a negative history for prior diabetes screened over 3 years at a hospital in Chicago, Illinois. The population was 39.1 percent white, 37.7 percent African American, 19.8 percent Hispanic, and 3.4 percent Asian/other. The protocol used came from the Second International Workshop-Conference on Gestational Diabetes Mellitus, in which patients underwent universal screening at 24-28 weeks with a 50 gram oral glucose load. Those with a 1-hour plasma glucose level of 7.2 mM or greater tested positive and were recalled for a 100 gram oral glucose tolerance test (OGTT) after carbohydrate loading of 150 g/day for 3 days and an overnight fast. For the OGTT, the diagnostic criteria used came from the standard O'Sullivan-Mahan values derived for plasma, as recommended by the National Diabetes Data Group, the American College of Obstetricians and Gynecologists, and the last international workshop-conference. At screening, researchers also recorded maternal race, age, prepregnant weight, height, and category of care provider (private versus nonprivate). Perinatal data collected included gestational age at delivery and birthweight. Researchers analyzed the data by multiple logistic regression, chi-square analysis, and analysis of covariance. Of the 3,744 patients screened, 22.8 percent (852) had a screen value of 7.2 mM or greater, and 15.3 percent (130) of these had a diagnostic OGTT, with 97.5 percent of patients reporting for OGTT. The overall GDM prevalence was therefore 3.5 cases per 100 screened. To assess the influence of choice of diagnostic criteria on prevalence, researchers applied two sets of criteria to the study data: The standard O'Sullivan-Mahan criteria and a modified form of the O'Sullivan-Mahan criteria. Use of the latter criteria would have ascertained an additional 75 patients, for a total of 5.5 cases per 100 screened. African American and Hispanic race, maternal age, and percentage ideal body weight were found to have significant independent effects on the prevalence of GDM. The adjusted relative risk of GDM was significantly higher in African-American and Hispanic patients (1.81 and 2.45, respectively) when compared with white patients. Researchers also examined the influence of race on infant birth in 92 patients with GDM controlled with diet. Despite comparable degrees of carbohydrate intolerance across racial groups, mean birthweight was found to be highest in Hispanics and lowest in African Americans and Asians. By analysis of covariance, race was found to have a significant independent effect on birthweight, with maternal percentage ideal body weight a significant covariate. Findings suggest that race as well as maternal age and degree of obesity must be taken into account when comparing the prevalence of GDM in different populations and assessing the impact of specific therapeutic interventions on perinatal outcome. 3 figures, 4 tables, 19 references.

077

Glucose Tolerance in Pregnancy: Ethnic Variation and Influence of Body Habitus.

Form: Journal article.
Author: Green, J.R.; Pawson, I.G.; Schumacher, L.B.; Perry, J.; Kretchmer, N.
Source: *American Journal of Obstetrics and Gynecology.* 163(1, Part 1):86-92, July 1990.

Abstract: Researchers conducted a prospective study of glucose tolerance during pregnancy in a multiethnic population by using a common standard for abnormality and without selecting participants for high-risk factors. They examined 3,366 Hispanic, Chinese, African American, and non-Hispanic white women in a universal screening program for gestational diabetes mellitus. Women who enrolled for prenatal care at San Francisco (California) General Hospital or one of its satellite clinics before completion of 32 weeks of pregnancy were potential candidates for this study. The hospital serves women of predominantly low-socioeconomic status; fewer than 5 percent have private health insurance. Between April 1983 and May 1986, all prenatal patients between 26 and 32 weeks of pregnancy underwent screening for gestational diabetes mellitus using a 50-gram glucose test. Women with abnormal results from the glucose load test were scheduled for a 3-hour glucose tolerance test. At the time of the glucose load test, researchers collected additional data and abstracted them onto a data sheet. Researchers confirmed maternal height and weight at the time of the glucose load test. They characterized patients as obese if weight-for-height exceeded 120 percent of ideal, when adjusted for expected pregnancy weight gain by locally generated curves. Body mass index (BMI) was calculated from height and weight at the time of screening. Maternal ethnicity, as self-identified, was recorded in more than 50 categories. Data were analyzed with a general linear models approach to determine the roles of maternal age and body mass index in glucose tolerance. A two-way analysis of variance was used to examine interaction between ethnicity and the independent variables. After maternal age and BMI were controlled, Chinese women had a significantly higher serum glucose level 1 hour after 50 grams of oral glucose than any of the remaining three groups. African American women had a significantly lower-serum glucose level than either Chinese or Hispanic women. Results for Hispanic women and non-Hispanic white women were intermediate. The rates of gestational diabetes among the ethnic groups followed a similar pattern. Chinese women had the highest incidence of gestational diabetes, Hispanic women had an intermediate incidence, and African American and non-Hispanic white women had the lowest incidence. 3 figures, 2 tables, 18 references.

078

Incidence of Gestational Diabetes: Effects of Race.

Form: Journal article.
Author: Kirshon, B.; Wait, R.B.
Source: *Texas Medicine.* 86(8):88-90, August 1990.

Abstract: Researchers sought to determine the prevalence of gestational glucose intolerance (GGI) in a large unselected group of pregnant patients, specifically to determine if Hispanics are more likely to have GGI than are either African-American or white patients. Researchers screened all prenatal clinic patients between 24 and 28 weeks gestation at Jefferson Davis Hospital in Houston, Texas, (2,435 pregnant women) for glucose intolerance. For those presenting after 28 weeks, the test was performed as soon as possible after the first visit. The screening consisted of a 50-gram glucose drink followed by a serum glucose determination in 1 hour. A level of 135 mg/dL was chosen as the upper limit of normal. Patients with 1-hour glucose levels greater than 135 mg/dL underwent a 3-hour oral glucose tolerance test (GTT) after 3 days of a diet containing 300 grams of carbohydrates daily. The patients were to fast after midnight on the evening prior to the test. A fasting serum glucose was obtained, after which a 100-gram glucose drink was administered. Patients with two or more abnormal values on the GTT's were regarded as persons with gestational diabetes and referred to a special diabetes clinic. Results were evaluated based on the three principal racial groups: (1) Hispanics, (2) African Americans, and (3) whites. Of those screened, 548 or 22.5 percent of test results were abnormal. From these, 154 abnormal glucose tolerance tests were recorded. This gave an overall 6.3 percent incidence of gestational diabetes. A total of 82 of the abnormal glucose tolerance tests were in Hispanic females, but this was not significantly higher than in other racial groups. 1 table, 18 references.

079

Predicting Future Diabetes in Latino Women With Gestational Diabetes: Utility of Early Postpartum Glucose Tolerance Testing.

Form: Journal article.
Author: Kjos, S.L.; Peters, R.K.; Xiang, A.; Henry, O.A.; Montoro, M.; Buchanan, T.A.
Source: *Diabetes.* 44(5):586-591, May 1995.

Abstract: Researchers tested 32 routine clinical parameters for their ability to discriminate between a high risk and a low risk of noninsulin dependent diabetes mellitus (NIDDM) within 5-7 years after pregnancies complicated by gestational diabetes mellitus (GDM). The study population came from 3,300 women with GDM who were diagnosed according to the National Diabetes Data Group criteria and who delivered at one of two hospitals in Los Angeles, California, between January 1987 and June 1993. Of these, the women with postpartum fasting glycemia concentrations greater than 7.8 mmol/L were advised to return within 4-16 weeks for a 75-gram oral glucose tolerance test (OGTT). Approximately 50 percent of the women returned for the early postpartum test and 10 percent of them had NIDDM. The remaining 1,493 women without diabetes were advised to return annually for a 75-gram OGTT. As of March 1994, 684 women had returned for at least one OGTT when they were not pregnant. Data from 671 of the 684 women, who had Spanish surnames and were from Mexico or Central America, were used to calculate the diabetes risks. Women were followed from their initial postpartum visit until their last follow-up visit before March 1994 or until they reached the study end point. Three types of variables were used to test for an association with the development of diabetes during followup: Elements of the maternal history antedating the index pregnancy, clinical characteristics of the index pregnancy, and clinical characteristics of the women at the postpartum examination. Cox proportional hazards regression analyses were used to examine the relationship between the historical, antepartum, and postpartum variables and the development of diabetes during followup. A total of 146 women developed NIDDM during followup. Life table analysis revealed a 47 percent cumulative incidence rate of NIDDM 5 years after delivery for this cohort of patients who did not have diabetes at initial postpartum examination. All of the antepartum and postpartum glycemic variables were associated with the development of NIDDM in the univariate analysis. Four variables were identified as independent predictors of NIDDM: (1) The area under the OGTT glucose curve at 4-16 weeks postpartum, (2) the gestational age at the time of diagnosis of GDM, (3) the area under the OGTT glucose curve during pregnancy, and (4) the highest fasting serum glucose concentration during pregnancy. Many of the variables associated with future NIDDM by univariate analysis were interrelated, however, and lost their predictive utility during multivariate analysis. Women who met World Health Organization criteria for impaired glucose tolerance at the early postpartum examination had a 5-year unadjusted 80 percent risk of diabetes, which was higher than the risk of NIDDM that has been reported for Latino people with a history of glucose intolerance who were not selected for a history of GDM. A history of GDM appears to impart a specific risk for NIDDM that cannot be explained by the degree of glucose tolerance observed when patients are not pregnant. 2 figures, 5 tables, 46 references.

080

Routine Screening for Gestational Diabetes in White, Black, and Mexican-American Teenagers.

Form: Journal article.
Author: Truscello, A.M.; Hollingsworth, D.R.; Felice, M.E.; Shragg, P.
Source: *Journal of Adolescent Health Care.* 9(2):150-155, March 1988.

Abstract: Researchers assessed the frequency of gestational diabetes in a multiethnic teenage pregnancy clinic by screening 137 women aged 12-18 years at 24 to 34 weeks gestation using a 1-hour 50-gram glucose tolerance test. The study population was drawn from pregnant African-American, white, and Mexican-American teenagers who registered in the University of California San Diego (UCSD) Teen Obstetrics Clinic between August 1978 and December 1982. Two-thirds of patients were on Medi-Cal. Patients were screened for gestational

diabetes between 24 and 34 weeks gestation with a 50-gram glucola test given at random. A venous plasma glucose level was measured 1 hour later. A value of greater than or equal to 140 mg/dl indicated the need for a 3-hour oral glucose test with 100 grams of glucose. All clinical data on each pregnancy were obtained prospectively and entered into the CLINFO computer at the UCSD General Clinical Research Center. For the purpose of data analysis, researchers divided the patients into three groups according to mean 1-hour plasma glucose levels: Group A (21 participants) had a mean 1-hour plasma glucose under 1 SD (60-82 mg/dl; 3.3-3.45 mmol/L) below the mean for all patients (103 plus or minus SD 22 mg/dl; 5.7 plus or minus SD 1.2 mmol/L); Group B (93 participants) had plasma glucose values over greater than 1 SD above the mean (126-180 mg/dl; 7-10 mmol/L); and Group C (23 participants) had plasma glucose values plus or minus 1 SD of the mean (83-125 mg/dl; 4.6-6.0 mmol/L). Researchers correlated the 1-hour plasma glucose values of the screening test with maternal prepregnancy weight, body mass index (BMI), weight gain during pregnancy, maternal morbidity, placental weight, infant birthweight, and infant morbidity. Researchers defined obesity as a prepregnancy or first trimester BMI of greater than 27. In a subset of 15 percent of patients, researchers verified weights before conception as accurate from clinic, job corps, or school records that antedated pregnancy. Screening tests were positive in eight teenagers (5.8 percent), half of whom were obese. Two primiparas (1.4 percent) met the O'Sullivan Mahan criteria for gestational diabetes. Fifty-four percent of participants had excessive maternal weight gain, and 8.7 percent of the total group had macrosomic infants. The adolescents with the highest glucose screening values gained the most weight (40 lb, 18 kg; p less than 0.05) during pregnancy. Maternal morbidity, mean gestational age, infant birthweight, Apgar scores, and infant morbidity did not differ among the three ethnic groups. Researchers concluded that gestational diabetes should be routinely screened for in all pregnant women, including teenagers. 3 figures, 3 tables, 18 references.

081

Sensory Neuropathy in Non-Insulin-Dependent Diabetes Mellitus: The San Luis Valley Diabetes Study.

Form: Journal article.
Author: Franklin, G.M.; Kahn, L.B.; Baxter, J.; Marshall, J.A.; Hamman, R.F.
Source: *American Journal of Epidemiology.* 131(4):633-643, 1990.

Abstract: Researchers examined the prevalence of distal symmetric (sensory) neuropathy among participants in the San Luis Valley Diabetes Study, a large population-based study of noninsulin dependent diabetes mellitus (NIDDM) among Hispanics and non-Hispanic whites in Colorado. They also estimated the prevalence of neuropathy by diabetes status, age, sex, ethnicity, and duration of diabetes and performed preliminary analyses with potential risk factors (alcohol use and glycemic control) for the development of neuropathy. The final sample included 279 persons diagnosed with NIDDM, according to the World Health Organization diabetes criteria. For the purposes of the current study, researchers completed a neurologic screening examination on all 279 persons with diabetes and 577 controls with normal (488 persons) or impaired (89 persons) glucose tolerance. The criteria for neuropathy included two of three of the following: (1) Numbness, burning, or tingling in both feet; (2) decreased ankle reflexes; and (3) decreased response to an iced tuning fork placed on the dorsum of the foot. The screening neurologic examination was compared with a standard neurologic examination performed by a neurologist. Distal symmetric neuropathy was validated with the Optacon vibration tester. Researchers used chi-square tests, the Kappa statistic, and logistic

regression analyses to compare the percent of specific symptoms related to neuropathy in those participants classified as having definite or possible distal symmetric neuropathy. Of those classified as having definite neuropathy, 97 percent were classified as definite on the basis of a positive history of symptomatic neuropathy plus at least one neurologic sign of neuropathy. The prevalence of definite neuropathy was 3.5 percent in participants with normal glucose tolerance, 11.2 percent in those with impaired glucose tolerance, and 27.8 percent in those with diabetes. The age-adjusted prevalence of definite neuropathy was 3.9 percent in participants with normal glucose tolerance, 11.2 percent in those with impaired glucose tolerance, and 25.8 percent in those with diabetes. Among persons with diabetes, the prevalence of neuropathy increased significantly with duration of diabetes. Mean, age-adjusted vibration threshold was greater in those with neuropathy than in those without. The subsets of the examination most sensitive in detecting neuropathy were a combination positive history of neuropathy symptoms and decreased or absent deep tendon reflexes in both ankles. The age- and duration-adjusted prevalence of neuropathy among men with diabetes was significantly greater than that among women with diabetes. Neuropathy was significantly associated with age, duration of diabetes, male sex, and glycemic control, but not with Anglo/Hispanic status. No difference was noted in the age- and duration-adjusted prevalence of neuropathy between Hispanic Americans and non-Hispanic whites. 8 tables, 35 references.

082

Use of Fetal Ultrasound to Select Metabolic Therapy for Pregnancies Complicated by Mild Gestational Diabetes.

Form: Journal article.
Author: Buchanan, T.A.; Kjos, S.L.; Montoro, M.N.; Wu, P.; Madrilejo, N.G.; Gonzalez, M.; Nunez, V.; Pantoja, P.M.; Xiang, A.
Source: *Diabetes Care.* 17(4):275-283, April 1994.

Abstract: Researchers examined whether fetal ultrasound early in the third trimester can identify Latinas with mild gestational diabetes mellitus (GDM) whose fetuses are at risk for macrosomia. Data came from a study of women with GDM who were diagnosed during a 30-month period from October 1989 through March 1992; in order to be eligible for the present study, participants had to be Hispanic Americans between 29 and 33 weeks gestation with otherwise uncomplicated pregnancies. Patients participated in a special diet, underwent an ultrasound, and had weekly blood samples taken for laboratory tests. After giving birth, patients continued to have glucose measurements taken. The final study group included 171 women who participated in the special diet program or who were placed on insulin therapy during their pregnancy. Results showed that plasma blood glucose levels at baseline did not differ significantly between the diet- and insulin-therapy groups. There was a significant decline of premeal and postmeal glucose levels during treatment in each group. Forty-two percent of the infants of the diet-treated patients were large for gestational age compared with 13 percent in the insulin-treated group. Gestational age at delivery was similar between the two groups. Rates of transient neonatal hypoglycemia were low in both treatment groups and did not differ significantly between groups. 4 figures, 2 tables, 24 references.

Defining the Burden: Sizing the Problem of Diabetes Among Hispanics/Latinos

Risk and protective factors for NIDDM

Diet and nutrition

083

Feeding the Hispanic Hospital Patient: Cultural Considerations.

Form: Journal article.
Author: Samolsky, S.; Dunker, K.; Hynak-Hankinson, M.T.
Source: *Journal of the American Dietetic Association.* 90(12):1707-1710, December 1990.

Abstract: Dietitians lose opportunities for effective dietary counseling if they fail to meet the food needs of people from a variety of cultures; ethnic factors strongly influence a person's overall eating pattern and food preparation methods. A discussion of major health problems, eating habits, and modified Hispanic diets attempts to assist health care practitioners in meeting the dietary needs of Hispanics in health care settings. Most Hispanic Americans are Mexican Americans, with Puerto Ricans as the next major subgroup; their cultural attitudes towards food differ substantially. Hispanics as a group tend to be more overweight and less physically active than non-Hispanic Americans, have a lesser prevalence of hypertension, and a greater prevalence of noninsulin dependent diabetes mellitus. Puerto Rican diets concentrate on rice and legumes (especially red kidney beans); eggs are the most commonly used protein, and pork, chicken, and codfish are the predominant meat and fish sources; plantains are the most common starch; milk is a rarely consumed beverage; fruit consumption is irregular, with the most common being banana, guava, and canned peaches, apples, pears, and fruit cocktail; beets and eggplant are common vegetables. In Mexican American diets the staples include corn, dried beans, chili peppers, and tomatoes; beef and chicken are the predominant meat sources; cheese is incorporated into most dishes; the corn tortilla is the Mexican version of bread; many vegetables are present in the diet, including beets, cabbage, pumpkin, tomatoes, and string beans; fruits include bananas, oranges, and chayotes; consumption of milk is rare; consumption of desserts, cakes, and cookies in large quantities is characteristic; most foods are highly spiced and fried in corn oil or olive oil. Modified menus for Puerto Rican and Mexican American populations should incorporate the food habits of each subculture with the most current information on food consumption patterns. Modified Hispanic menus including diet modifications for energy-, fat-, and sodium-restricted diets are discussed. The Dietary Guidelines for Americans should also be used as a guide in menu planning. Dietitians must consider cultural and demographic influences to help Hispanic patients modify their diet in ways that are both healthful and culturally acceptable. 1 figure, 34 references.

084

High-Fat, Low-Carbohydrate Diet and the Etiology of Non-Insulin-dependent Diabetes Mellitus: The San Luis Valley Diabetes Study.

Form: Journal article.
Author: Marshall, J.A.; Hamman, R.F.; Baxter, J.
Source: *American Journal of Epidemiology.* 134(6):590-603, September 15, 1991.

Abstract: To investigate the role of dietary fat and carbohydrate as potential risk factors for the onset of noninsulin dependent diabetes mellitus (NIDDM), researchers assessed diet among a geographically-based group of 1,317 Hispanic and non-Hispanic white persons without a prior diagnosis of diabetes who were seen in 1984-1988 in two counties in southern Colorado. Participants from the San Luis Valley Diabetes Study were compared with control persons who were confirmed as being without diabetes. Participants attended a 4-hour morning clinic. After contributing fasting blood samples, the participants received 75 grams of a glucose drink. Blood samples were drawn at 1 and 2 hour intervals following the glucose load. During this time, interviews and a physical examination were conducted. The 1985 World Health Organization (WHO) criteria for diabetes were used to classify persons with normal glucose tolerance (1,076 persons), impaired glucose tolerance (171 persons), and previously undiagnosed diabetes (70 persons). Researchers used the 1980 U.S. Census self-assessment question on Hispanic origin to determine ethnicity. Researchers also assessed (1) body mass index (BMI), (2) waist and hip measurements, and (3) family history. Physical activity assessments included a 7-day physical activity recall interview and additional questions on participation in vigorous activity at work or leisure. For the diet assessments, bilingual interviewers trained and certified by the Nutrition Coordinating Center at the University of Minnesota administered a 24-hour diet recall. Adjusted mean nutrient intakes were calculated using the general linear models procedure and LSMEANS in the Statistical Analysis System (SAS). Adjusted odds ratios were estimated by logistic regression using Generalized Linear Interactive Modeling (GLIM). Body mass index, age, and dietary variables were entered as continuous variables in the logistic model. Odds ratios were adjusted for age, sex, ethnic group, and total calories. The independent effect of total calories was determined by replacing fat with the calorie-adjusted residual for fat. Persons with impaired glucose tolerance reported significantly higher intake of total fat and lower intake of total carbohydrate and sucrose when compared with persons with normal glucose tolerance after adjusting for age, sex, ethnicity, and calories. Persons with NIDDM reported macronutrient intakes similar to persons with impaired glucose tolerance, but their intakes were not statistically different from those of the control group. 6 tables, 58 references.

085

On the Role of Vitamin D Binding Globulin in Glucose Homeostasis: Results From the San Luis Valley Diabetes Study.

Form: Journal article.
Author: Iyengar, S.; Hamman, R.F.; Marshall, J.A.; Majumder, P.P.; Ferrell, R.E.
Source: *Genetic Epidemiology.* 6(6):691-698, 1989.

Abstract: Researchers investigated the role of vitamin D, which is bound and transported by a polymorphic glycoprotein, group-specific component (GC), in glucose homeostasis, in a population of Hispanic Americans and non-Hispanic whites in the San Luis Valley of southern Colorado. Participants were assayed for several variables related to glucose homeostasis, including glucose, C-peptide, and insulin levels at three time points, fasting and at 1 hour and 2 hours following a 75 gram carbohydrate load. Data came from the San Luis Valley Diabetes Study, a population-based case-control study investigating noninsulin dependent diabetes mellitus (NIDDM) risk factors, prevalence, and complications in Hispanics and non-Hispanic whites. The sample included 924 Hispanics and non-Hispanic whites who underwent fasting glucose and glucose tolerance testing; only 468 individuals with normal glucose tolerance (according to the World Health Organization criteria for glucose tolerance) and no previous history of diabetes were included in the analyses. Researchers also determined GC genotypes for all participants by a thin-layer polyacrylamide gel

IEF followed by direct precipitation of GC protein bands as described by Kamboh et al. (1984). They used analysis of covariance to compare differences between genotypes. Results showed that the factors of ethnicity and sex were not significant, so researchers pooled data for Hispanics and non-Hispanic whites as well as for males and females. Subsequent analyses showed that for the three variables of fasting glucose, insulin, and C-peptide levels, a significant difference occurred only for fasting glucose among the different GC genotypes. Differences in adjusted means of 1-hour glucose values among the GC genotypes, although not significant at the 5 percent level, were significant at the 10 percent level. 3 tables, 29 references.

086

Use of Focus Groups to Explore Nutrition Practices and Health Beliefs of Urban Caribbean Latinos With Diabetes.

Form: Journal article.
Author: Quatromoni, P.A.; Milbauer, M.; Posner, B.M.; Carballeira, N.P.; Brunt, M.; Chipkin, S.R.
Source: *Diabetes Care.* 17(8):869-873, August 1994.

Abstract: To provide insight into important features of diabetes prevention and management, researchers conducted focus groups to explore nutrition practices and health beliefs. All adult Latinos from Puerto Rico and the Dominican Republic aged 20 years and older and receiving care at one of three health clinics in Boston, Massachusetts, were invited to participate in the study. Spanish and English flyers were used to recruit Latinos with diabetes and their family members. Focus groups were conducted in Spanish by two trained Latino moderators and occurred over a 12-week period between June and August 1992. Researchers chose focus group locations based on the need for a relaxed and familiar environment that would encourage informal discussion. A total of 30 Latinos with noninsulin dependent diabetes mellitus (NIDDM) and 4 family members participated in the 4 focus groups. The majority of participants were from Puerto Rico, and most were unemployed. Nearly all participants agreed that diabetes had a strong negative social impact. Latinos with diabetes believed that they were unable to participate fully in daily activities, varying from household chores to social gatherings. They also believed that diabetes adversely affected other medical conditions, including high blood pressure, asthma, and arthritis. Most expressed fears of disabling complications of diabetes, such as blindness and amputations. All participants believed that exercise was important for someone with diabetes but had little sense that exercise would greatly improve their prognosis. Most participants were also unclear about the role of diet in the management of diabetes. Focus group participants exhibited a consistent willingness to try management approaches that were reported to be successful by other Latinos with diabetes. 19 references.

See also 001, 011

Defining the Burden: Sizing the Problem of Diabetes Among Hispanics/Latinos

Risk and protective factors for NIDDM

Physical activity/exercise

087

Aggregation of Physical Activity Habits in Mexican-American and Anglo Families.

Form: Journal article.
Author: Sallis, J.F.; Patterson, T.L.; Buono, M.J.; Atkins, C.J.; Nader, P.R.
Source: *Journal of Behavioral Medicine.* 11(1):31-41, February 1988.

Abstract: Researchers used standardized and validated measures to examine the familial aggregation of physical activity by assessing physical activity habits as obtained through standardized interviews among adults and children in 96 Anglo and 102 Mexican-American families in San Diego, California. They gathered data as part of a trial of family-based cardiovascular health education known as the San Diego Family Health Project. Families of children in grades five and six were recruited from 12 elementary schools. In half of the schools Mexican-American families were recruited; in the other half, Anglo families were recruited. Baseline measures were collected between October 1984 and February 1985. All assessments were conducted at local schools, and all interviews were conducted individually. Researchers used the 7-day Physical Activity Recall (PAR) to assess physical activity. They also measured height and weight and used the Quetelet index as a measure of body mass index (BMI). Six correlations were computed for each measure using SPSS-X (Statistical Package for Social Services): (1) Spouse pairs, (2) father with younger children, (3) father with older children, (4) mother with younger children, (5) mother with older children, and (6) sibling pairs. Researchers divided children by age group because they theorized that parental influence would differ as a result of child age. In addition to zero-order correlations, partial correlations adjusting for BMI were calculated. Results indicated a moderate degree of aggregation of physical activity in both samples, and adjustment for BMI was inconsequential. Among Anglos, overall energy expenditure (kilocalories per kilogram per day or KKD) was significantly correlated only for siblings and mother-older child pairs; the mother younger-child correlation was of borderline significance. For the measure of hard leisure activity, the mother's activity was significantly correlated with scores for both children, although the correlation was much higher for older children. Intrafamily correlations were higher among Mexican-Americans. Energy expenditure was significantly correlated for fathers and older children, for mothers and both younger and older children and for sibling pairs. Family aggregation of vigorous activity for Mexican Americans was less pronounced; spouse pairs were correlated and the mother's exercise was related to that of both younger and older children. 2 figures, 1 table, 45 references.

088

Physical-Activity-Assessment Measures Compared in a Biethnic Rural Population: The San Luis Valley Diabetes Study.

Form: Journal article.
Author: Mayer, E.J.; Alderman, B.W.; Regensteiner, J.G.; Marshall, J.A.; Haskell, W.L.; Baxter, J.; Hamman, R.F.
Source: *American Journal of Clinical Nutrition.* 53(4):812-820, April 1991.

Abstract: Researchers evaluated the consistency of three questionnaire methods of assessing work and leisure activity in the rural biethnic population of the San Luis Valley (Colorado) Diabetes Study (SLVDS). They compared the following methods used by SLVDS: (1) A 7-day physical activity recall, adapted from the Stanford interview; (2) a self-assessed ranking of habitual activity; and (3) a history of participation in vigorous activity. Multiple comparisons were used to evaluate consistency between the activity assessment instruments. Because the physical activity recall was evaluated against other biochemical and physiologic measures, researchers used it as the primary instrument against which to compare the other measures. They modified the Stanford 7-day physical activity recall for use by dividing the week into work versus nonwork time rather than into weekdays versus weekends. Non-Hispanic white participants were 54 percent male and 46 percent female and Hispanic participants were 46 percent male and 54 percent female. Ethnicity was determined by self-report by using the 1980 U.S. Census method. Approximately 71 percent of the men and 84 percent of the women worked; 22 percent of the men and 11 percent of the women were retired. Researchers asked participants to recall work activities and nonwork activities. With the assistance of the interviewers, respondents determined classification of activities as work or nonwork. During a separate medical history interview, participants ranked their level of physical activity at work and at leisure. Those who performed any vigorous activity were asked about the frequency and duration of the vigorous activity. Researchers asked full-time homemakers (46 percent of the women) to consider homemaking their work. Trained interviewers administered all interviews using either an English or a Spanish translated version as needed. Age-adjusted mean energy expenditure estimated from the physical activity recall was compared with the rank and vigorous-activity scores for subgroups of sex, ethnicity, and occupation. Age-adjusted means and mean energy expenditures were obtained from analysis of covariance procedures by using the SAS statistical software package. The SAS general linear models procedure was used to produce age-adjusted partial correlation coefficients. Physical activity at work rather than leisure-time activity largely determined total energy expenditure. Consistency between the physical activity recall and the two other instruments and between the physical activity recall and physiologic variables was demonstrated in this rural population for work-related activities among non-Hispanic white men. For Hispanic men and women and non-Hispanic white women, consistency was observed between the physical activity recall and the self-assessed ranking of usual activity level at work. For leisure-time activities, consistency was observed between the physical activity recall and the other two interviews only for non-Hispanic white men. Correlations between the physical activity recall and a series of physiologic measures were strongest for non-Hispanic white men. 4 figures, 3 tables, 19 references.

See also 001

Defining the Burden: Sizing the Problem of Diabetes Among Hispanics/Latinos

Risk and protective factors for NIDDM

Serum lipids

089

Do Upper-Body and Centralized Adiposity Measure Different Aspects of Regional Body-Fat Distribution? Relationship to Non-Insulin-Dependent Diabetes Mellitus, Lipids, and Lipoproteins.

Form: Journal article.
Author: Haffner, S.M.; Stern, M.P.; Hazuda, H.P.; Pugh, J.; Patterson, J.K.
Source: *Diabetes.* 36(1):43-51, January 1987.

Abstract: Researchers assessed body mass index (BMI), the ratio of subscapular-to-triceps skinfold (STR), the ratio of waist-to-hip circumference (WHR), lipids, lipoproteins, and glucose tolerance among 738 Mexican Americans aged 25-64 years who participated in phase II of the San Antonio (Texas) Heart Study, a population-based study of diabetes and cardiovascular risk factors. Researchers conducted an initial interview in the participant's home. After this, they performed a medical examination in a mobile clinic located in the participant's neighborhood. The examination included measurements of height, weight, STR, and WHR. BMI was calculated as weight in kilograms divided by height in meters squared. Blood samples were drawn after a 12-hour fast for serum lipids and lipoproteins and plasma glucose. Serum cholesterol was determined by the cholesterol oxidase method. Low and very low density lipoproteins were measured by a modification of the procedures used by the Lipid Research Clinics. After the fasting blood specimen was obtained, a 75-gram glucose-equivalent load was administered, and blood samples were obtained .5-hour, 1-hour, and 2-hours later for plasma glucose determinations. Adjusted means were computed by two-analysis of covariance with sex and presence or absence of diabetes as the grouping variables. Multiple logistic regression was used to estimate the relative strength of the association between NIDDM prevalence and age, BMI, STR, and WHR. The effect of WHR, STR, and BMI on lipids and lipoproteins was determined by multiple linear regression. In general, STR and WHR were associated with high noninsulin dependent diabetes mellitus (NIDDM) rates, low HDL cholesterol levels, and high triglyceride levels, although WHR was somewhat more predictive of these than STR. Among females, BMI, WHR, and STR all made independent contributions to prediction of NIDDM and HDL cholesterol. Among males, WHR and STR both made independent contributions to prediction of triglyceride levels. 7 tables, 59 references.

090

Does Glycemic Control of Type II Diabetes Suffice to Control Diabetic Dyslipidemia? A Community Perspective.

Form: Journal article.
Author: Stern, M.P.; Mitchell, B.D.; Haffner, S.M.; Hazuda, H.P.
Source: *Diabetes Care.* 15(5):638-644, May 1992.

Abstract: To assess the extent to which glycemic control by itself results in satisfactory control of diabetic dyslipidemia, researchers studied a population-based case series consisting of 386 Mexican Americans and 94 non-Hispanic whites with noninsulin dependent diabetes mellitus (NIDDM). The participants analyzed were drawn from the cohort enrolled in the San Antonio Heart Study. All participants underwent a standard oral glucose tolerance test. Using criteria from the National Diabetes Data Group (NDDG), researchers diagnosed a total of 179 Mexican Americans and 58 non-Hispanic whites in the present study for the first time at their survey visit. Researchers designated these individuals as newly-diagnosed. They designated the remaining participants with diabetes as previously diagnosed. All participants completed a detailed medical history questionnaire, which included questions on the type of diabetes therapy and frequency of physician visits within the preceding year. Researchers used three definitions for dyslipidemia (total cholesterol greater than 6.20 mM (240 mg/dl), triglyceride greater than 2.82 mM (250 mg/dl), and high-density lipoprotein cholesterol less than 0.90 mM (35 mg/dl)). Prevalences of dyslipidemia were age-adjusted by multiple logistic regression. Despite having removed participants receiving lipid-lowering drugs, those with diabetes who had been previously diagnosed and were under medical care exhibited a lower prevalence of hypertriglyceridemia than those who were newly-diagnosed at the time of their survey visit, suggesting that conventional management was associated with a reduced frequency of this dyslipidemia. Among previously diagnosed cases, the prevalence of dyslipidemia rose with worsening glycemic control, but little association existed with type of therapy (diet only, oral agents, or insulin) or frequency of physician visits. In general, the prevalence of dyslipidemia in participants with diabetes remained higher than in participants without diabetes, despite hypoglycemic therapy. Results suggest that glycemic control by itself does not control diabetic dyslipidemia and that significant numbers of persons with diabetes need direct lipid management. Results of the study underscore the need for clinical trials to pinpoint the effectiveness of strategies for controlling dyslipidemia. 5 tables, 42 references.

091

Lack of Awareness and Treatment of Hyperlipidemia in Type II Diabetes in a Community Survey.

Form: Journal article.
Author: Stern, M.P.; Patterson, J.K.; Haffner, S.M.; Hazuda, H.P.; Mitchell, B.D.
Source: *Journal of the American Medical Association (JAMA).* 262(3):360-364, July 21, 1989.

Abstract: Researchers examined 374 Mexican Americans and 86 non-Hispanic whites identified from the San Antonio Heart Study to determine the level of control of hyperlipidemia among persons with noninsulin dependent diabetes (NIDDM or type II) in the community. For the purposes of this study, researchers designated all individuals who met criteria set by the National Cholesterol Education Program (NCEP) as hyperlipidemic. The NCEP criteria are oriented toward identifying individuals with elevated low-density lipoprotein (LDL) cholesterol levels. However, the principal lipid abnormalities encountered in NIDDM are elevated triglyceride and very low-density lipoprotein (VLDL) cholesterol levels and reduced high-density lipoprotein (HDL) cholesterol levels. Therefore, researchers also examined those who did not meet these criteria, but who nevertheless had a triglyceride concentration greater than 2.82 mmol/L and/or an HDL cholesterol concentration less than 35 mg/dL. To classify participants as either aware or unaware of their hyperlipidemia, researchers asked all those participating in the survey whether they had ever been told by a doctor that they had high blood cholesterol or a high level of fat in the blood. They also asked participants to bring all current physician-prescribed medications to the survey clinic. More than 40 percent of the persons with diabetes were hyperlipidemic according to the criteria of the NCEP, and an additional 23 percent had hypertriglyceridemia and/or low levels of high-density lipoprotein cholesterol. By contrast, less than one fourth of the persons without diabetes were hyperlipidemic. Non-Hispanic whites were more likely to be aware of and receiving treatment for hyperlipidemia than Mexican Americans. However, these differences were statistically significant only among individuals without diabetes (for awareness, chi square equal to 12.10, p equal to 0.001; for treatment, chi square equal to 3.93, p equal to .047). Approximately 25 percent of non-Hispanic whites with diabetes were aware of their hyperlipidemia, but only 8.1 percent were receiving treatment. Awareness and treatment were even less frequent among Mexican Americans with diabetes. Approximately 19 percent were aware of their hyperlipidemia, but only 3.9 percent were receiving treatment. In conclusion, community physicians should be encouraged to give early attention and treatment to hyperlipidemia in persons with diabetes. 5 tables, 50 references.

092

Serum Lipids Within 36 Mo of Delivery in Women With Recent Gestational Diabetes.

Form: Journal article.
Author: Kjos, S.L.; Buchanan, T.A.; Montoro, M.; Coulson, A.; Mestman, J.H.
Source: *Diabetes.* 40(Supplement 2):142-146, December 1991.

Abstract: Researchers prospectively evaluated fasting serum total cholesterol, low- and high-density lipoprotein cholesterol, and triglycerides in a large cohort of Hispanic women during the first 36 months after pregnancies complicated by gestational diabetes mellitus (GDM). Data came from a total of 2,652 births complicated by GDM in the Los Angeles, California, area from January 1987 through June 1990. Researchers defined all cases according to the criteria of the National Diabetes Data Group (NDDG). Ninety-five percent of the women with GDM were of Latin American origin or descent. Between 6 and 12 months postpartum, 1,340 of the women returned for further testing, which included a fasting lipid profile and an oral glucose tolerance test (OGTT). To determine whether lipid levels in women with prior GDM were elevated compared to those in women without such a history, researchers also recruited two healthy control groups who had delivered 6-12 weeks earlier and who agreed to metabolic testing. Researchers analyzed the relationship between serum lipids and the OGTT using analysis of variance (ANOVA), t-tests, and linear regression analyses. Results showed that of the 1,320 women tested in the postpartum GDM group, 120 (9 percent) met NDDG criteria for diabetes mellitus. Of these, 59 (49 percent) had a fasting serum glucose level of greater than or equal to 7.84 mM. An additional 127 women (9.5 percent) were found to have impaired glucose tolerance (IGT). Means of age, parity and arterial pressure were not significantly different between the IGT or diabetes groups and the normal glucose tolerance group. At the 3- to 11-month testing interval, women diagnosed with diabetes had decreased levels of high-density lipid cholesterol compared with normal and IGT groups. After the first 12 months postpartum, the annual glucose tolerance status of 157 women without diabetes with prior GDM was not associated with any significant differences in cholesterol, high-density lipids, or low-density lipids. Overall, the prevalence of high-risk low-density lipids in the 12-month followup of women without diabetes with prior GDM was not different than that of control participants. Findings suggest that lipid abnormalities are uncommon during the first 36 months after delivery among women with recent GDM. 4 tables, 30 references.

Defining the Burden: Sizing the Problem of Diabetes Among Hispanics/Latinos

Risk and protective factors for NIDDM

Obesity and adiposity distribution

093

Comparison of Adiposity Measures for Screening Non-Insulin Dependent Diabetes Mellitus.

Form: Journal article.
Author: Sosenko, J.M.; Kato, M.; Soto, R.; Goldberg, R.B.
Source: *International Journal of Obesity and Related Metabolic Disorders.* 17(8):441-444, August 1993.

Abstract: To compare the relative accuracies of adiposity measures for screening noninsulin dependent diabetes mellitus (NIDDM), researchers conducted a study in which measures of adiposity extent and distribution were obtained on the same day that 521 persons underwent oral glucose tolerance testing for the presence of diabetes. They compared the accuracies of three adiposity distribution measures (waist and hip circumferences, subscapular and triceps skinfold thicknesses, waist-hip and subscapular-triceps ratios) with a measure of adiposity extent (body mass index). Researchers identified 600 people from community notices and asked them to participate in a study in which they would be tested for diabetes. The study was limited to persons aged 25-60 years. Individuals with a history of glucose intolerance or who were on medication that could influence glucose tolerance testing were excluded. All of the participants resided in Dade or Broward counties in south Florida. The sample was 63 percent Hispanic and 58 percent female. Participants were seen after a 12-hour overnight fast. Fasting glucose samples were obtained followed by the ingestion of 75 grams of carbohydrate. Blood samples were then collected at 30 minute intervals for 2 hours. During the glucose tolerance test, researchers performed anthropometric measurements (i.e., height, weight, waist, and hip circumferences and subscapular and triceps skinfold thicknesses). Of 521 participants (218 men and 303 women) who had 2-hour oral glucose tolerance tests, 43 men and 28 women were found to have NIDDM. There was a significantly higher prevalence of NIDDM in men than in women, but there were no significant differences between Hispanic and non-Hispanic participants. Those found to have NIDDM were significantly older than those who were without diabetes (mean age 51.9 years versus 43.7 years, respectively). Allowing for age, ethnicity, and family history in analyses of covariance, the subscapular skinfold thickness and the ratio of the subscapular to triceps skinfold thicknesses were significantly higher in both the men and women found to have diabetes than in their counterparts without diabetes. 1 figure, 3 tables, 14 references.

094

Diabetes Alert Study: Weight History and Upper Body Obesity in Diabetic and Non-Diabetic Mexican American Adults.

Form: Journal article.
Author: Joos, S.K.; Mueller, W.H.; Hanis, C.L.; Schull, W.J.
Source: *Annals of Human Biology.* 11(2):167-171, March-April 1984.

Abstract: Researchers compared history of adult weight gain and fat patterning in Mexican-Americans with diabetes and age and sex matched Mexican-Americans without

diabetes. A diabetes prevalence survey among members of a randomly selected sample of households resulted in a sample of 10 percent of the population over age 15 in a southern Texas county. It was found that the age-specific prevalence of diabetes in the adult population was 2-4 times that of the same-aged United States population. Anthropometric examination of the sample, completed in June 1983, included 15 body measurements (e.g., height, weight, triceps skinfold, subscapular skinfold, waist skinfold, medial calf skinfold, and lateral calf skinfold). Participants answered questions about their history of adult weight gain. Information on the history of weight gain included reported (1) maximum weight, (2) age at maximum weight, (3) weight at age 18, and (4) age when weight gain began. Body mass index (BMI) was computed for weight at age 18, maximum weight, and current weight. Velocity of gain between age 18 and age at maximum weight was also computed by dividing the difference between BMI at maximum weight and at age 18 by the number of years elapsed between age 18 and age at maximum weight. All skinfold measures were taken on the right side. Persons with diabetes differed little from persons without diabetes in overall body fatness at the time of the examination. However, history of adult weight gain and current fat patterning were very different. Persons with diabetes were heavier than persons without diabetes at age 18. They subsequently gained weight faster and attained a substantially higher weight, at an earlier age, than normoglycemic persons. 1 figure, 1 table, 9 references.

095

Diabetes, Gallbladder Disease, Obesity, and Hypertension Among Hispanics in New Mexico.

Form: Journal article.
Author: Samet, J.M.; Coultas, D.B.; Howard, C.A.; Skipper, B.J.; Hanis, C.L.
Source: *American Journal of Epidemiology.* 128(6):1302-1311, December 1988.

Abstract: Hypothesizing that because Hispanics of New Mexico are genetically admixed with Native Americans who have an exceptionally high frequency of noninsulin dependent diabetes mellitus (NIDDM), obesity, and gallbladder disease, they will have excess NIDDM, obesity, and gallbladder disease, researchers surveyed 40 randomly ordered sampling units in a semirural city located near Albuquerque, New Mexico, in 1984-1985. Researchers conducted in-home surveys among 1,175 adult Hispanic participants (483 males and 692 females) in a homogeneous population comprised almost exclusively of New Mexico Hispanics. Data collection included a questionnaire on chronic health problems, which covered diabetes mellitus, gallbladder disease, and hypertension. The questionnaires were based on those developed by the Epidemiology Standardization Project of the American Thoracic Society. Physical measurements made in the home included spirometry, blood pressure, resting pulse, height, and weight. Interviewers were instructed in blood pressure measurement using the American Heart Association guidelines. Data analyses were limited to persons aged 18 years and older who were self-classified as Hispanic. Persons were considered to have diabetes mellitus if they responded affirmatively to the question: Has a doctor or nurse ever told you that you have diabetes or sugar diabetes? Researchers considered persons as having gallbladder trouble if they responded positively to the question: Has a doctor ever told you that you have trouble with your gallbladder? The approach to blood pressure measurements

followed that of the National Health and Nutrition Examination Survey II, 1976-1980. To describe the prevalence of overweight, researchers calculated body mass index (BMI) as the ratio of weight in kilograms to height squared in meters. All analyses were performed with standard programs of the Statistical Analysis System. The prevalence of obesity and diabetes mellitus among these Hispanics was greater than that reported by non-Hispanic whites nationwide. The prevalence of diabetes mellitus and obesity among New Mexico Hispanics tends to be intermediate to that of whites and Mexican Americans studied in Starr County, Texas, and in San Antonio, Texas. The Mexicans have a substantial degree of American Indian admixture and share the Spanish language, a religious heritage strongly based on Catholicism, and certain dietary habits with the New Mexico Hispanics; however, both groups have evolved distinct cultural traditions. A report of gallbladder trouble or of gallbladder removal was common among both males and females among both New Mexico Hispanics and Mexican Americans in Starr County. In males, gallbladder trouble was more frequent among Mexican Americans in Starr County than among New Mexico Hispanics, but the rates of gallbladder removal were similar in the two groups. Nationwide data show that hypertension was less frequent among the New Mexico Hispanics than among non-Hispanic whites. 4 figures, 5 tables, 34 references.

096

Diminished Insulin Sensitivity and Increased Insulin Response in Nonobese, Nondiabetic Mexican Americans.

Form: Journal article.
Author: Haffner, S.M.; Stern, M.P.; Dunn, J.; Mobley, M.; Blackwell, J.; Bergman, R.N.
Source: *Metabolism.* 39(8):842-847, August 1990.

Abstract: Researchers measured insulin sensitivity and response in nonobese Mexican American and non-Hispanic white individuals with normal glucose tolerance, making use of the minimal model of Bergman et al. Twenty-one nonobese healthy employees and graduate students of the University of Texas Science Center at San Antonio were recruited for frequent glucose tolerance tests. All participants in the study had fasting glucose concentrations of less than 100 mg/dL. The participant group included 10 Mexican Americans (4 male, 6 female) and 11 non-Hispanic whites (4 male, 7 female). Mexican Americans were defined as persons whose ancestry and cultural traditions were principally of Mexican national origin. All participants were at least college graduates. Female participants had not taken oral contraceptives in the year before the study and none of the participants gave a parental history of diabetes. Researchers conducted anthropometric measurements, oral glucose tolerance tests, and intravenous glucose tolerance tests (IVGTT's) on participants. The nonparametric Mann-Whitney test, Spearman correlation coefficients, and ANOVA were used to make associations between variables. Individual estimates of insulin sensitivity from the IVGTT's were calculated using the MINIMOD Program approach of Bergman et al. The glucose and insulin data were fit to two minimal models, the first for glucose kinetics and the second for insulin kinetics. The glucose model is forced to account for glucose data when insulin data are supplied; the insulin model accounts for plasma insulin if glucose data are supplied. Results showed that the participating Mexican Americans and non-Hispanic whites had similar age, body mass index (BMI), sum of skinfolds, and upper-body and centralized adiposity. Fasting glucose and C-peptide concentrations were also similar in both groups, although fasting insulin was twofold higher in Mexican Americans. Mexican Americans and non-Hispanic whites did not differ significantly in their glucose curves. However, Mexican Americans did have higher insulin and C-peptide curves, suggesting that Mexican Americans may have greater insulin secretion. Despite similar adiposity and fasting glycemia, Mexican Americans had significantly lower insulin sensitivity. Insulin sensitivity was correlated with BMI in the overall group. The effect of adiposity may be greater in Mexican Americans. 1 figure, 1 table, 37 references.

097

Does Obesity Explain Excess Prevalence of Diabetes Among Mexican Americans? Results of the San Antonio Heart Study.

Form: Journal article.
Author: Stern, M.P.; Gaskill, S.P.; Hazuda, H.P.; Gardner, L.I.; Haffner, S.M.
Source: *Diabetologia.* 24(4):272-277, April 1983.

Abstract: Researchers studied 936 Mexican Americans and 398 Anglo-Americans who were randomly selected from three socially and culturally distinct neighborhoods in San Antonio, Texas. Participants aged 25-64 years were randomly sampled from a low-income (barrio) neighborhood, a middle-income (transitional) neighborhood, and a high-income (suburb) neighborhood. The study design included an initial home interview followed by a medical examination in a mobile clinic. Researchers performed ethnic classification by using an algorithm that considered (1) interviewer identification, (2) Spanish or non-Spanish surname of both parents, and (3) stated ethnicity of all four grandparents. Anthropometric measurements included stature, weight, and skinfold thicknesses. Fasting blood specimens were obtained after a 12-hour overnight fast. Subsequent specimens were obtained 1 and 2 hours after ingestion of a 75-gram glucose equivalent carbohydrate load. The study defined three categories of obesity on the basis of the distribution of the sum of the triceps and subscapular skinfolds of the Anglo population. The Anglo skinfold distribution was divided into equal thirds: (1) The lowest third was labeled lean, (2) the middle third was labeled average, and (3) the upper third was labeled obese. This procedure was carried out separately for the two sexes. The distribution of Mexican American participants across the three obesity categories was tested using a chi-square statistic under the null hypothesis that a third of the participants should have fallen into each category. Mexican Americans were two to four times as likely to fall into the obese category as Anglos, but within categories, the two ethnic groups were closely matched in terms of sum of skinfolds. The prevalence of noninsulin dependent diabetes mellitus (NIDDM), however, was significantly greater among Mexican Americans than among Anglos even when the comparisons were made within the three obesity categories. The study defined diabetes according to criteria recommended by the National Diabetes Data Group. 8 tables, 18 references.

098

Increased Upper Body and Overall Adiposity Is Associated With Decreased Sex Hormone Binding Globulin in Postmenopausal Women.

Form: Journal article.
Author: Haffner, S.M.; Katz, M.S.; Dunn, J.F.
Source: *International Journal of Obesity.* 15(7):471-478, 1991.

Abstract: Researchers examined the relationship of body mass index (BMI), ratio of subscapular-to-triceps skinfold ratio (centrality ratio), and ratio of waist-to-hip ratio (WHR) to sex hormone binding globulin (SHBG) in 101 postmenopausal Mexican-American and non-Hispanic white women. Data came from the San Antonio (Texas) Heart Study, a population-based study of diabetes and cardiovascular disease. Frozen contingency serum samples were available for 101 participants between ages 41 and 64 years (61 Mexican Americans and 40 whites). Researchers conducted anthropometric measurements, health history surveys, plasma glucose tests, and SHBG analyses on all participants. They used Spearman correlation coefficients, multiple linear regression, and analysis of variance to study the relationships between the variables. Results showed that the mean SHBG (nmol/L) in the overall population was 76.4 plus or minus 9.8. The mean SHBG in Mexican Americans was 62.4 and in non-Hispanic whites was 85.2. Since the effect of obesity and body fat distribution on SHBG was the same in both ethnic groups, they pooled the ethnic groups to increase statistical power. In subsequent analyses, SHBG was significantly negatively related to BMI, WHR, and centrality index and positively related to alcohol intake. Findings suggest that in postmenopausal women overall adiposity and an unfavorable body fat distribution are associated with increased androgenicity as measured by a lower SHBG concentration. 2 figures, 4 tables, 54 references.

099

Non-Insulin-Dependent Diabetes and Obesity in the Black and Hispanic Population: Culturally Sensitive Management.

Form: Journal article.
Author: Raymond, N.R.; D'Eramo-Melkus, G.
Source: *Diabetes Educator.* 19(4):313-317, July-August 1993.

Abstract: Researchers suggest that because the combined effects of obesity and noninsulin dependent diabetes mellitus (NIDDM) can lead to potentially serious complications, overweight patients with NIDDM must undergo aggressive treatment. The prevalence of diabetes is considerably higher among ethnic minorities, particularly African Americans and Hispanic Americans, than in the nonminority population. Obesity, a significant risk factor for NIDDM, is also more common in those ethnic groups. Effective treatment for different ethnic groups requires a sensitivity to and recognition of their cultural values. Diabetes educators and health care providers must consider specific ethnic beliefs, customs, food patterns, and health care practices with the goal of incorporating these cultural factors into practical and beneficial treatment regimens. Patients with NIDDM need a diet that is nutritionally balanced and meets recommended daily allowance (RDA) requirements. Moderate caloric restriction may be optimal in producing gradual, sustained weight loss. Under careful medical supervision, very-low-calorie diets (VLCD) may work for people who are severely obese. Research indicates the combination of a VLCD and behavior modification produces greater weight loss on a long-term basis than a VLCD alone. Potential barriers to health care recommendations for ethnic minorities with diabetes and obesity include (1) lack of knowledge due to culturally insensitive patient education materials and programs; (2) incorrect health beliefs; (3) lack of access to health care; and (4) a high prevalence of poverty. Many researchers advocate the

implementation of a screening program to determine which individuals will be most successful in a weight-loss program. Traditional screening techniques may discourage African American and Hispanic individuals from entering weight-loss programs, so screening must also be culturally sensitive. Culturally sensitive patient educators are needed who respect cultural differences in values, such as ideal body size. Culturally relevant educational print material must take into account language nuances and ethnic food patterns, servings, uses, and relevance. It is important not to refute folk beliefs but rather incorporate those beliefs into the treatment as a complementary aspect that enhances the confidence of the patient. 2 tables, 45 references.

100

Public Health Significance of Upper Body Adiposity for Non-Insulin Dependent Diabetes Mellitus in Mexican Americans.

Form: Journal article.
Author: Haffner, S.M.; Mitchell, B.D.; Stern, M.P.; Hazuda, H.P.; Patterson, J.K.
Source: *International Journal of Obesity and Related Metabolic Disorders.* 16(3):177-184, March 1992.

Abstract: Researchers compared the impact of upper body fat distribution and body mass index (BMI) on noninsulin dependent diabetes mellitus (NIDDM) using the population attributable risk approach of Levin in 1,965 Mexican Americans from the San Antonio (Texas) Heart Study. The report concerns only individuals with NIDDM who participated in phase II of the San Antonio study since waist and hip circumferences were measured only in phase two. Participants with diabetes who were not taking insulin or who, if they were taking insulin, had an age of onset greater than age 40 and a BMI greater than 30 kg/m squared were considered to have NIDDM. Researchers made anthropometric measurements for height, weight, and waist and hip circumferences. They measured waist circumference using a steel tape at the level of the umbilicus and hip circumference at the level of the greater trochanters. The average of two readings was taken as the measurement for each circumference. Researchers used the ratio of waist to hip circumference (WHR) as a measure of upper body adiposity, and BMI as a measure of overall adiposity. The study assessed the age-adjusted associations between BMI and NIDDM and between WHR and NIDDM using multiple logistic regression models. All statistical analyses were performed with the SYSTAT statistical package. The population attributable risk (PAR) percentage was 52.0 percent for WHR compared to 43.4 percent for BMI. After stratification by BMI, women with a high WHR had a PAR percentage of approximately 50 percent and men had a PAR percentage of 28 to 58 percent. Data indicate that WHR is a better single screening measure for NIDDM than is BMI. 1 figure, 5 tables, 34 references.

101

Relationship of Sex Hormone Binding Globulin to Overall Adiposity and Body Fat Distribution in a Biethnic Population.

Form: Journal article.
Author: Haffner, S.M.; Katz, M.S.; Stern, M.P.; Dunn, J.F.
Source: *International Journal of Obesity.* 13(1):1-9, 1989.

Abstract: Since previous studies indicated that Mexican Americans have higher greater overall and upper body adiposity, higher rates of noninsulin dependent diabetes mellitus (NIDDM), higher triglycerides and lower high-density lipid (HDL) levels than non-Hispanic whites, researchers examined whether they would also have lower levels of sex hormone binding globulin (SHBG). They also examined whether decreased SHBG is associated with increased overall adiposity and an unfavorable body fat distribution (more centralized and upper body adiposity), and whether the ethnic difference in SHBG is due to differences in overall adiposity and body fat distribution. Data came from the San Antonio (Texas) Heart Study, a population-based study of cardiovascular risk factors and diabetes in Mexican Americans and non-Hispanic whites. The present report is based on a random sample of premenopausal women aged 25-54 years, 61 Mexican Americans and 39 non-Hispanic whites, residing in a middle-income neighborhood surveyed in 1984-1985. Only women with an intact uterus and ovaries who were taking neither oral contraceptives nor estrogens were included in the sample. All participants were examined to determine anthropometric measurements, body mass index (BMI), blood glucose tolerance after a 12-hour fast, total testosterone and total estradiol, and SHBG using the dextran coated charcoal method. Individuals with hypertension according to the Hypertension Detection and Followup Program criteria and diabetes according to the National Diabetes Data Group criteria were excluded. Researchers used one-way analyses of variance and Spearman correlation coefficients to compare the variables of interest. Results showed that Mexican American women had higher subscapular skinfolds and centrality indexes than non-Hispanic white women. There were no statistically significant differences in age, BMI, waist or hip circumference, triceps skinfold, waist-to-hip ratio, total testosterone, free testosterone, total estradiol, or free estradiol between the two groups. Percentage of free testosterone and percentage of free estradiol were significantly higher in Mexican American than in non-Hispanic white women. SHBG was significantly higher (by 50 percent) in non-Hispanic whites. After adjusting for BMI, ratio of waist-to-hip circumference, and ratio of subscapular-to-triceps skinfolds, SHBG remained lower in Mexican Americans than non-Hispanic whites, although the difference was no longer statistically significant. Results suggest that the lower levels of SHBG in premenopausal Mexican American women compared to non-Hispanic white women may reflect greater in-vivo androgenicity and may be related to a variety of metabolic abnormalities previously observed in Mexican Americans. 4 tables, 41 references.

102

Role of Obesity and Fat Distribution in Non-insulin-dependent Diabetes Mellitus in Mexican Americans and Non-Hispanic Whites.

Form: Journal article.
Author: Haffner, S.M.; Stern, M.P.; Hazuda, H.P.; Rosenthal, M.; Knapp, J.A.; Malina, R.M.
Source: *Diabetes Care.* 9(2):153-161, March-April 1986.

Abstract: Researchers examined whether central obesity (measured by the ratio of subscapular to triceps skinfold) was predictive of noninsulin dependent diabetes mellitus (NIDDM) prevalence independent of overall obesity (measured by body mass index (BMI)) among 1,231 Mexican Americans and 939 non-Hispanic whites who participated in the San Antonio (Texas) Heart Study, a population-based survey of diabetes and cardiovascular risk factors. The present report is based on 950 men and 1,220 women for whom fasting glucose measurements were available. Because socioeconomic status (SES) has been shown to be negatively associated with NIDDM prevalence, the study controlled for SES in selected analyses, using educational status as the indicator of SES. Blood samples were drawn after a 12-hour fast for plasma glucose determination. A 75-gram glucose-equivalent load was then administered and blood samples were drawn 1 and 2 hours later for postglucose load plasma glucose determinations. Anthropometric measurements for height, weight, and subscapular and triceps skinfold were made with the participant wearing an examining gown. BMI was calculated as weight in kilograms divided by height in meters squared. Researchers computed the ratio of subscapular to triceps skinfold as an index of central versus peripheral adiposity. Adjusted means were computed by analysis of covariance using the Biomedical Computer Programs statistical package P1V. Using multiple logistic regression with age, ethnicity, BMI, and central obesity as covariates, overall obesity was positively associated with NIDDM prevalence in both sexes but central obesity was related to NIDDM prevalence only among women. Although both BMI and centrality narrow the ethnic difference in NIDDM prevalence between Hispanic Americans and non-Hispanic whites, Hispanic Americans still have an increased incidence of NIDDM (odds ratio equals 2.33 in men and 1.80 in women). 6 tables, 41 references.

103

Social Epidemiology of Overweight: A Substantive and Methodological Investigation.

Form: Journal article.
Author: Ross, C.E.; Mirowsky, J.
Source: *Journal of Health and Social Behavior.* 24(3):288-298, September 1983.

Abstract: Researchers examined (1) the relationship of social and cultural factors to overweight in a cross-national community survey in the United States and Mexico and (2) the effects of Mexican heritage, social class, marital status, age, and sex on weight. There were 230 participants in the Mexican-identity group and 233 in the Anglo-identity group. The comparative, cross-sectional study of Mexican and Anglo heritage adults collected data using a survey questionnaire administered in face-to-face home interviews in 1975 in El Paso, Texas, and Juarez, Mexico. African Americans, Asians, Native Americans, Jews, and persons not raised in the United States or Mexico were excluded from the survey. In El Paso, dwellings were randomly selected from the city directory, and one adult aged 18-65 years was randomly selected from each household. In Juarez, a multistage area sample based on aerial photographs was used because of the absence of accurate information on which to base a sampling frame. Variables included (1) Mexican versus Anglo identity, (2) social class, (3) age, (4) sex, (5) marital status, and (6) weight and height. Social class was measured as a sum of three standardized variables: (1) Years of formal education, (2) family income, and (3) occupational prestige. Using regression analysis with interaction terms, researchers found that sex has different effects on overweight for Mexicans and Anglos and at different social class levels. Anglo men are fatter than Mexican men, but Mexican women are fatter than Anglo women. Among the Mexicans, the overweight levels of men and women are fairly similar, with women being fatter than men. Among Anglos, the women are much thinner than the men. With increasing social class, overweight decreases for women, but social class has little effect on the overweight levels of men. 4 figures, 4 tables, 32 references.

104

Special Health Problems of Mexican-Americans: Obesity, Gallbladder Disease, Diabetes Mellitus, and Cardiovascular Disease.

Form: Book chapter.
Author: Diehl, A.K.; Stern, M.P.
Source: IN: *Advances in Internal Medicine.* Volume 34. Stollerman, G.H.; Harrington, W.J.; LaMont, J.T.; Leonard, J.J.; Siperstein, M.D.; eds. Chicago, IL, Year Book Medical Publishers, Inc., pp. 73-96, 1989.
Availability: Year Book Medical Publishers, Inc., 200 North LaSalle Street, Chicago, IL 60601. (800) 622-5410. (312) 726-9746.

Abstract: Special Health Problems of Mexican-Americans: Obesity, Gallbladder Disease, Diabetes Mellitus, and Cardiovascular Disease, a book chapter in Advances in Internal Medicine, Volume 34, presents a literature review examining the health problems of Mexican Americans. Mexican Americans have a disease burden that differs from that of the non-Hispanic majority. In particular, high prevalences of obesity, gallbladder disease, and type two (noninsulin dependent) diabetes mellitus (NIDDM) characterize this population. Topics include (1) background information on Mexican Americans, (2) obesity, (3) gallbladder disease, (4) prevalence surveys of clinical gallbladder disease in Texas and Hispanic populations in the southwest, (5) gallbladder cancer epidemiology, (6) possible reasons for the ethnic differences regarding the higher rate of gallbladder disease among Mexican Americans, (7) diabetes mellitus, and (8) cardiovascular disease. The reasons for the greater adiposity of Mexican Americans are uncertain. Since obesity in the United States is inversely related to socioeconomic status (SES), at least in women, it may be questioned whether the greater adiposity of Mexican Americans is an intrinsic characteristic of this population or rather a consequence of the relatively low SES of most Mexican Americans in United States society. Factors underlying the higher rate of gallbladder disease in Mexican Americans still remain to be determined and may include (1) biased measurement rates, (2) the apparent differences are attributable to confounding, (3) the differences are related to cultural factors, or (4) the higher rates result from a genetic predisposition to cholelithiasis introduced by Amerindian ancestors. There is now abundant evidence that the prevalence of diabetes is higher in Mexican Americans than in non-Hispanic whites. Moreover, it appears that this excess prevalence is exclusively of the NIDDM variety, since data from insulin dependent diabetes mellitus (IDDM) registries in Colorado and southern California indicate that IDDM is less common in Mexican Americans than in non-Hispanic whites. Mortality data reported from California, New Mexico, and Texas reveal a consistent pattern in which cardiovascular mortality is approximately equal in Mexican-American and non-Hispanic women, but lower in Mexican-American men than in non-Hispanic men.

105

Special Issues Regarding Obesity in Minority Populations.

Form: Journal article.
Author: Kumanyika, S.K.
Source: *Annals of Internal Medicine.* 119(7, Part 2):650-654, October 1, 1993.

Abstract: A researcher provides an overview of some of the issues surrounding obesity research, including disparities among ethnic groups in obesity prevalence and the link between obesity and chronic illnesses such as diabetes mellitus. Among non-Hispanic whites, the obesity rate is about one in four adults; however, this figure is much higher in many minority populations, particularly among women. Obesity is most pronounced in Pacific Islanders; prevalence rates for some Native Americans, such as the Pima Indians, are also very high. Low-income women in some minority groups appear to have the greatest likelihood of being overweight. For example, among Mexican-American women aged 20 to 74 years, the age-adjusted prevalence of overweight is 46 percent for women living below the poverty line compared with 40 percent for those living above the poverty line. Comparable figures for non-Hispanic women are 39 percent and 25 percent for women below and above the poverty line, respectively. Minority populations also have a higher prevalence of obesity-related diseases than do white populations, particularly in the case of diabetes mellitus. Diabetes prevalence is 16 to 26 percent in Hispanic and African Americans aged 45-74 years compared with 12 percent in non-Hispanic whites in this age group. The prevalence of diabetes in the Native American population is estimated to be more than twice that in the general population, although substantial variation occurs across tribes. Available data for African Americans also indicate a high prevalence of several other obesity-related diseases, including cardiovascular diseases, cerebrovascular diseases, and osteoarthritis; however, the overall health impact of obesity-related diseases in minority populations is less clear. Because of situational and cultural factors, effective obesity prevention and treatment approaches may need to be defined on an ethnicity-specific basis. All aspects of the causes of obesity and treatment require more study in specific minority populations and among minorities in general. 2 tables, 49 references.

See also 011, 013, 032, 060, 089

Defining the Burden: Sizing the Problem of Diabetes Among Hispanics/Latinos

Risk and protective factors for NIDDM

Syndrome X

106

Hyperdynamic Circulation and the Insulin Resistance Syndrome (Syndrome X).

Form: Journal article.
Author: Stern, M.P.; Morales, P.A.; Haffner, S.M.; Valdez, R.A.
Source: *Hypertension.* 20(6):802-808, December 1992.

Abstract: Hypothesizing that a hyperdynamic state manifested by a widened pulse pressure and tachycardia might represent an early state of insulin resistance syndrome (syndrome X) and that fixed hypertension might be a later feature, researchers used the San Antonio (Texas) Heart Study (SAHS) cohort to define individuals who were hyperdynamic (i.e., pulse pressure and heart rate in the upper quartile of the respective distribution), intermediate, and hypodynamic (i.e., pulse pressure and heart rate in the bottom quartile of the distribution). Researchers sought to determine if, after 8 years of followup, some of the long-term sequelae of the insulin resistance syndrome (i.e., diabetes and hypertension) were more likely to develop in hyperdynamic individuals. Insulin resistance syndrome is described as consisting of insulin resistance, glucose intolerance, hypertriglyceridemia, low levels of high-density lipoprotein (HDL) cholesterol, and hypertension. Researchers examined the 8-year incidence of hypertension and of noninsulin dependent diabetes mellitus (NIDDM) according to these hemodynamic categories. The SAHS population-based cohort was enrolled in two phases, the first from 1979 to 1982 and the second from 1984 to 1988. In both phases, researchers randomly selected households from three types of neighborhoods: (1) Low-income barrios, (2) middle-income transitional neighborhoods, and (3) high-income suburbs. The present study includes 4,118 Mexican American and non-Hispanic white participants who are without diabetes and hypertension. Beginning in 1987, an 8-year followup was begun and the followup for the phase one (1979-1982) cohort is complete. Vital status was ascertained for 97.8 of the original participants. Researchers defined the participants as hyperdynamic, intermediate, and hypodynamic on the basis of their heart rate and pulse pressure. The effect of a hyperdynamic circulation on anthropometric, physiological, and metabolic variables was tested by two-way analysis of covariance (ANCOVA). The grouping variables were one of the three hemodynamic categories and sex, ethnic group, or body mass index (BMI). Age was a covariate in these analyses. Hyperdynamic individuals display many of the features of the insulin resistance syndrome. Although hyperdynamic circulation was not predictive of future hypertension, it was highly predictive of NIDDM. 4 tables, 57 references.

107

Prospective Analysis of the Insulin-Resistance Syndrome (Syndrome X).

Form: Journal article.
Author: Haffner, S.M.; Valdez, R.A.; Hazuda, H.P.; Mitchell, B.D.; Morales, P.A.; Stern, M.P.
Source: *Diabetes.* 41(6):715-722, June 1992.

Abstract: Researchers examined the relationship of fasting insulin concentration (as an indicator of insulin resistance) to the incidence of multiple metabolic abnormalities in the 8-year followup of the cohort enrolled in the San Antonio (Texas) Heart Study. The San Antonio Heart Study is a population-based study of diabetes and cardiovascular disease in Mexican Americans and non-Hispanic whites. The current study concerns the 8-year followup that began October 1987 of 969 Mexican American participants and 704 non-Hispanic participants aged 25-64 years in the first phase of the San Antonio Heart Study, the 1979 to 1982 cohort. However, the results presented are based on 1,125 participants who had complete data for all variables used in the present analysis. At baseline followup, researchers obtained blood specimens from participants after a 12-14 hour fast for determination of serum lipid, lipoprotein, insulin, and plasma glucose concentrations. Insulin levels were determined using a commercial radioimmunoassay. A 75-gram glucose load was then administered to participants and blood samples collected at 1 and 2 hours. Researchers diagnosed diabetes and impaired glucose tolerance according to the World Health Organization plasma glucose criteria. Systolic and diastolic blood pressure were measured; hypertension was defined according to the Hypertension Detection and Follow-up Program criteria. Anthropometric measurements were made and body mass index was calculated. Using multiple regression analysis, researchers calculated the relative risk of developing a metabolic disorder for participants in all fasting insulin categories. Participants in the highest quartile of fasting insulin were significantly older and had significantly higher body mass index, total cholesterol, triglycerides, blood pressure, fasting glucose, and 2-hour glucose levels. In multivariate analyses, after adjustment for obesity and body fat distribution, fasting insulin continued to be significantly related to the incidence of decreased high-density lipoprotein cholesterol, increased triglyceride concentrations, and the incidence of noninsulin dependent diabetes mellitus. Baseline insulin concentrations were higher in participants who subsequently developed multiple metabolic disorders. These concentrations were not attributable to differences in baseline obesity and were similar in Mexican Americans and non-Hispanic whites. There was no evidence of an interaction between ethnicity and insulin category, suggesting that the effect of insulin on baseline metabolic parameters was similar in both ethnic groups. 6 tables, 58 references.

Defining the Burden: Sizing the Problem of Diabetes Among Hispanics/Latinos

Risk and protective factors for NIDDM

Genetic predisposition/ethnic admixture

108

Comparison of Three Methods for Assessing Amerindian Admixture in Mexican Americans.

Form: Journal article.
Author: Mitchell, B.D.; Williams-Blangero, S.; Chakraborty, R.; Valdez, R.; Hazuda, H.P.; Haffner, S.M.; Stern, M.P.
Source: *Ethnicity and Disease.* 3(1):22-31, Winter 1993.

Abstract: Researchers evaluated the comparability of three different methods of assessing individual genetic admixture in Mexican Americans to determine why they experience an excess of noninsulin dependent diabetes mellitus, gallbladder disease, and obesity relative to non-Hispanic whites. Data came from the San Antonio (Texas) Heart Study, a population-based survey of cardiovascular risk factors and diabetes in Mexican Americans and non-Hispanic whites. All men and nonpregnant women aged 25 to 64 years residing in randomly selected households were eligible to participate in the study. A total of 1,394 males and 1,907 females participated; 610 males and 981 females resided in barrio neighborhoods, 364 males and 476 females resided in transitional neighborhoods, and 420 males and 450 females resided in suburban neighborhoods. To assess a panel of genetic markers, participants received a medical examination at a mobile clinic that evaluated (1) fasting and postload blood glucose levels, (2) body mass index (BMI), (3) gallbladder disease status, and (4) blood specimens. Diabetes was diagnosed on the basis of glucose levels according to World Health Organization criteria. Obesity was defined as BMI greater than or equal to 30 kg/m2. Hypertension was defined as a diastolic pressure over 94 mm Hg or current use of antihypertensive medications. Researchers evaluated skin reflectance as a rank-order of admixture of Amerindian and European white genetic heritage. They generated admixtures for each patient using three different measures, including genetic markers, skin color, and proportion of Mexican-origin grandparents as reported by the participants. The relationship between disease prevalence and each admixture estimate was evaluated by comparing the prevalence of each disease among participants in the top 25 percent of the admixture distribution (most admixed) with those in the bottom 25 percent of the distribution (least admixed). Researchers used multiple logistic regression to test for associations between admixture and disease prevalence. Admixture was highest among participants who lived in the barrio, intermediate in transitional neighborhoods, and lowest in the suburban neighborhoods. Among both sexes, individuals in the barrio reported on average more grandparents of Mexican origin than did individuals in the transitional neighborhoods, and individuals in the transitional neighborhoods reported more grandparents of Mexican origin than did those in the suburbs. Skin reflectance was lowest in the barrio (indicating the darkest skin color), intermediate in the transitional neighborhoods, and highest in the suburbs. Among both sexes, the highest correlations with disease occurred for lower skin reflectance and higher proportion of Mexican-origin grandparents. None of the three measures used to determine admixture was superior to the others. 2 figures, 4 tables, 42 references.

109

Differences in the Prevalence of Diabetes and Impaired Glucose Tolerance According to Maternal or Paternal History of Diabetes.

Form: Journal article.
Author: Mitchell, B.D.; Valdez, R.; Hazuda, H.P.; Haffner, S.M.; Monterrosa, A.; Stern, M.P.
Source: *Diabetes Care.* 16(9):1262-1267, September 1993.

Abstract: Researchers sought to determine whether diabetes risk is influenced by which parent is reported to have diabetes. They compared the prevalence of noninsulin dependent diabetes mellitus (NIDDM) and impaired glucose tolerance for 4,914 persons according to their parental history of diabetes (mother only, father only, both parents, neither parent). Individuals were from the San Antonio (Texas) Heart Study, a population-based survey of diabetes and cardiovascular risk factors conducted among Mexican American and non-Hispanic white individuals between 1979 and 1988. Researchers performed a physical examination including height and weight measurement. Plasma glucose was measured from blood samples drawn after a 12-hour fast and a 75-gram glucose equivalent load was administered. A second blood sample was obtained 2 hours later. Diabetes was diagnosed according to the plasma glucose criteria of the World Health Organization (WHO). Individuals who did not meet WHO criteria but who gave a history of diabetes and were currently taking either oral antidiabetic agents or insulin also were considered to have diabetes. Researchers asked participants if either of their parents had diabetes. On the basis of this information, they were classified into one of four groups: (1) Persons reporting that their mother, but not their father, had diabetes; (2) persons reporting that their father, but not their mother, had diabetes; (3) persons reporting that both parents had diabetes; and (4) persons reporting that neither parent had diabetes. Clinical characteristics of study participants were compared according to ethnic group and sex. Differences between groups were compared by ANOVA (for age and body mass index) and by chi-square test (for parental history of diabetes and glucose tolerance status). Odds ratios, adjusted for ethnicity and age, were calculated by logistic regression analysis. Men with a parental history of diabetes had a higher prevalence of both NIDDM and impaired glucose tolerance than men reporting no parental history of diabetes. Prevalence was equally high regardless of which parent, or whether both parents, had diabetes. In contrast, among women, only a maternal history of diabetes was associated with a higher prevalence of NIDDM and impaired glucose tolerance. Virtually no difference in NIDDM prevalence was found among women with a paternal-only history of diabetes and women with no parental history of diabetes. 3 tables, 22 references.

110

Do Anthropometric Differences Between Mexican Americans and Non-Hispanic Whites Explain Ethnic Differences in Metabolic Variables?

Form: Journal article.
Author: Stern, M.P.; Haffner, S.M.
Source: *Acta Medica Scandinavica Supplementum.* 723:37-44, 1988.

Abstract: Researchers sought to determine if the anthropometric differences between Mexican Americans and non-Hispanic whites could account for the ethnic differences in metabolic profile. The persons analyzed in this report were 1,576 Mexican Americans and 525 non-Hispanic whites drawn from phase II of the San Antonio (Texas) Heart Study, 1984-1986. Eligible subjects were defined as all males and nonpregnant women, aged 25-64 years, residing in randomly selected households from three San Antonio neighborhoods: (1) A low-income barrio, (2) a middle-income transitional neighborhood, and (3) a high-income suburb. Body mass index (BMI) was used as a measure of overall adiposity. The ratio of subscapular skinfold to triceps skinfold (STR) was used as a measure of the tendency for body fat to accumulate on the central part of the body or trunk as opposed to the extremities. The ratio of waist circumference to hip circumference (WHR) was used as a measure of upper as opposed to lower body adiposity. Diabetes was diagnosed according to the National Diabetes Data Group criteria. Participants who reported a history of diabetes and who were also taking either insulin or oral antidiabetic agents were considered to have diabetes regardless of glucose tolerance. The greater BMI and STR of Mexican Americans compared to non-Hispanic whites confirms earlier observations from phase I of the San Antonio Heart Study. Mexican-American women also have greater WHR's compared to non-Hispanic white women, but there is no ethnic difference in WHR in men. Results show that overall adiposity, as measured by BMI, and the distribution of body fat, as measured by WHR and STR, account for some, but not all, of the ethnic differences in metabolic variables and diabetes prevalence between Mexican Americans and non-Hispanic whites. 8 tables, 18 references.

111

Genetic and Environmental Determinants of Type II Diabetes in Mexico City and San Antonio.

Form: Journal article.
Author: Stern, M.P.; Gonzalez, C.; Mitchell, B.D.; Villalpando, E.; Haffner, S.M.; Hazuda, H.P.
Source: *Diabetes.* 41(4):484-492, April 1992.

Abstract: To study genetic and environmental determinants of noninsulin dependent (type II) diabetes, researchers compared a random sample of Mexican-American men and women aged 35-64 years living in several low-income barrios of San Antonio, Texas, to similarly aged Mexicans living in a low-income colonia of Mexico City, Mexico. A total of 1,138 Mexican Americans and 646 Mexicans participated in the study. Diabetes was diagnosed using World Health Organization (WHO) criteria. At both study sites, researchers measured (1) height, (2) weight, (3) subscapular and triceps skin folds, (4) waist and hip circumferences, (5) systolic and diastolic blood pressure, (6) skin reflectance, and (7) body mass index (BMI). Fasting plasma glucose concentration and fasting serum insulin, cholesterol, and triglyceride concentrations were determined. Before beginning the survey in Mexico City, the Mexico City clinic staff traveled to San Antonio and participated in a week-long joint training session with the San Antonio staff. Researchers developed food-frequency questionnaires independently for the San Antonio and the Mexico City populations. Although the two questionnaires had identical formats, the individual food items differed and reflected the foods most commonly consumed in the respective study sites. Physical activity was assessed with the Stanford 7-day Physical Activity Recall instrument. Age-adjusted differences in continuous variables between San Antonio and Mexico City were evaluated by two-way analysis of covariance with the GLM procedure in SAS. The direct method was used to age adjust diabetes prevalence for each sex separately with the sex-specific combined populations of the two cities as the standard population. The prevalence of diabetes was 36 percent higher among San Antonio Mexican Americans than among Mexicans in Mexico City. This excess was observed despite the fact that genetic susceptibility, as inferred from the admixture skin reflectance estimates, was similar in the two cities. On the other hand, Mexicans were somewhat leaner as measured by BMI and skin folds. Mexican women consumed fewer total calories than Mexican-American women, but there was no difference in the caloric intake of men. 6 tables, 58 references.

112

Is There an Ethnic Difference in the Effect of Risk Factors for Diabetic Retinopathy?

Form: Journal article.
Author: Haffner, S.M.; Mitchell, B.D.; Moss, S.E.; Stern, M.P.; Hazuda, H.P.; Patterson, J.; Van Heuven, W.; Klein, R.
Source: *Annals of Epidemiology.* 3(1):2-8, January 1993.

Abstract: Researchers compared the effect of established risk factors for retinopathy between Mexican Americans with diabetes identified in the San Antonio Heart Study (SAHS) and whites with diabetes identified from the Wisconsin Epidemiologic Study of Diabetic Retinopathy (WESDR). Risk factors examined included age at examination, sex, age at diagnosis of diabetes, duration of diabetes, glycemia, type of therapy, systolic and diastolic blood pressure, and hypertension prevalence. The sample included 478 whites with diabetes and 231 Mexican Americans with diabetes. Diabetes was diagnosed according to the criteria of the National Diabetes Data Group (NDDG). To facilitate comparisons between the two populations, researchers restricted data to participants aged 30-70 years at the time of the examination and whose diabetes was diagnosed between ages 30-70 years. For the Texas study, researchers calculated the glucose sum as the sum of the fasting, 1-hour, and 2-hour glucose values obtained during the oral glucose tolerance test. Because glucose tolerance test results were not available from the Wisconsin study, researchers used glycosylated hemoglobin as the measure of glycemia for that present study. Researchers in both studies used identical methods for assessing diabetic retinopathy. In both studies, certified photographers obtained seven stereoscopic fundus photographs of each eye, using procedures adapted from the Early Treatment of Diabetic Retinopathy Study. Researchers assessed socioeconomic status by years of education in both studies, and also determined blood pressure by the same methods in both studies. Ethnic differences in risk distributions between Mexican Americans and whites were evaluated for statistical significance by t-tests for continuous variables and by chi-square tests for categorical variables. A test for linear trend was used to assess the effect of each factor on retinopathy. Stepwise multiple logistic regression was used to test for ethnic differences in the effect of each risk factor on retinopathy (adjusting for all other risk factors). Results of the comparative analysis showed that Mexican Americans with diabetes had an increased prevalence of any retinopathy (odds ratio equal to 1.71, 95 percent confidence interval: 1.25, 2.34), compared to whites with diabetes. Longer duration of diabetes, more severe glycemia, earlier age at diagnosis, and insulin therapy were associated with diabetic retinopathy among both groups. Socioeconomic status was not associated with prevalence of retinopathy. The effect of risk factors for retinopathy was also similar among both ethnic groups. Findings suggest that effect modification (i.e., a more negative effect of a given risk factor) is not a likely explanation for the greater severity of retinopathy in Mexican Americans. 3 tables, 39 references.

113

No Excess of DR3/4 in Ashkenazi Jewish or Hispanic IDDM Patients.

Form: Journal article.
Author: Rubinstein, P.; Walker, M.; Mollen, N.; Carpenter, C.; Beckerman, S.; Suciu-Foca, N.; McEvoy, R.; Ginsberg-Fellner, F.
Source: *Diabetes.* 39(9):1138-1143, September 1990.

Abstract: Researchers examined the gene frequencies, haplotype relative risks, and zygotic assortments of human leukocyte antigen-DR gene (HLA-DR) in three ethnically-defined samples of insulin dependent diabetes mellitus (IDDM) patients. The patients, who were index cases to the families in this study, all had classic IDDM according to National Diabetes Data Group (NDDG) criteria. They were sequentially ascertained between 1977 and 1989, and researchers invited their families to participate in this research without regard to the number of additional family members affected or in good health. After granting informed consent, each family completed a genetic questionnaire containing information on the national origin and religious background of the four grandparents of the respective proband. Researchers identified class I and class II antigens with the contrast-fluorescence test and the two-color fluorescence method, respectively. They standardized antiserums with reference to reagents from the 8th, 9th, and 10th International Workshops on Histocompatibility Testing. All families were studied by intrafamilial mixed-lymphocyte culture tests. Researchers determined class III allotypes of the Bf locus in all families and those of C2 and C4 in selected pedigrees with standard electrophoretic techniques to help resolve cases of HLA-genotype ambiguity. Affected and control haplotypes were used in the computation of antigen and gene frequencies within each ethnic group. From these were derived the haplotype relative risks and the gene frequencies for the study of Hardy-Weinberg equilibrium. Although DR3 and DR4 were positively associated with IDDM in the probands of 123 northern European, 94 Ashkenazi Jewish, and 49 New York Hispanic families, results showed significant excess of DR3/4 heterozygotes only among the probands from families of northern European ancestry. Results indicate that Hardy-Weinberg conditions did not exist in the 123 northern European white probands. The largest deviations are an excess of DR3/4 and a deficit of DR4/4 genotypes. In contrast, the Hispanic and Ashkenazi samples were in the Hardy-Weinberg equilibrium. The frequencies of the relevant B, DR3 haplotypes are similar in all three ethnic groups and virtually identical in the northern European and Ashkenazi probands. In contrast, the frequencies of the B, DR4 haplotypes are very different and some are essentially restricted to one (e.g., B38, DR4 in Ashkenazi Jewish) or two of the three populations (Bw62, DR4). Results also showed in the case of DR4 probands, northern European mothers contributed significantly fewer Bw62, DR4 haplotypes than did fathers (3 versus 13) and Hispanic mothers may also have done so (2 versus 6). Across all groups, 17 Bw62, DR4 haplotypes came from fathers and 5 from mothers. The opposite trend was observed for the B7, DR4 haplotype: Northern European fathers (one versus seven) and perhaps Jewish fathers (two versus six) but not Hispanic fathers (two versus one) gave this haplotype to probands less often than did the corresponding mothers (overall 5 versus 14). 5 tables, 40 references.

114

Origins of U.S. Hispanics: Implications for Diabetes.

Form: Journal article.
Author: Hanis, C.L.; Hewett-Emmett, D.; Bertin, T.K.; Schull, W.J.
Source: *Diabetes Care.* 14(7, Supplement 3):618-627, July 1991.

Abstract: Researchers examined demographic characteristics of the contemporary United States Hispanic population and considered the historical and genetic evidence regarding the origins and heterogeneity of this group in the context of diabetes risk. Researchers focused on the genetic origins of the three major Hispanic groups, as derived from census data, in the United States: (1) Mexican Americans, (2) Puerto Ricans, and (3) Cubans. Researchers took genetic marker data for ancestral populations (Spanish, Native American, and West African) from a review of the literature and compendia. They extracted genetic marker data for Puerto Rican and Cuban populations from the literature. For the Mexican American population, researchers determined genetic marker data on approximately 1,000 randomly-selected Mexican Americans from Starr County, Texas. Within Starr County, researchers mapped the three major population areas and randomly selected city blocks in these areas. Within selected blocks, one random age-eligible individual was invited for a complete physical evaluation that included blood sampling for the determination of disease risk factors and genetic markers. Computation of ancestral affinities followed the least-squares procedure. Researchers tested three different population models. First, each admixed group was considered a trihybrid population having Spanish, Native American, and African American ancestry. Researchers then fit two dihybrid models for each group; one that considered only Spanish and Native American ancestry and one that considered only Spanish and African-American ancestry. Results showed heterogeneity among the three Hispanic populations. For Mexican Americans, researchers estimated that 31 percent of the contemporary gene pool is Native American derived, whereas 61 percent and 8 percent are Spanish- and African-derived, respectively. In Puerto Rico, the percentage of contributions of Spanish, Native American, and African admixture to the population are 45 percent, 18 percent, and 37 percent respectively. For Cuba, parallel estimates are 62 percent, 18 percent, and 20 percent. Researchers conclude that the high frequency of Native American-derived genes in the contemporary Hispanic population predict a higher frequency of noninsulin dependent diabetes mellitus (NIDDM). Appendixes contain information on ancestral and Hispanic allele frequencies. 3 figures, 1 table, 30 references.

115

Parental History of Diabetes Is Associated With Increased Cardiovascular Risk Factors.

Form: Journal article.
Author: Haffner, S.M.; Stern, M.P.; Hazuda, H.P.; Mitchell, B.D.; Patterson, J.K.; Ferrannini, E.
Source: *Arteriosclerosis.* 9(6):928-933, November-December 1989.

Abstract: Researchers examined 549 persons without diabetes with a parental history of diabetes and 1,167 persons without diabetes without such a history to determine cardiovascular risk factors. They used participants from the San Antonio (Texas) Heart Study, a population-based study of cardiovascular disease and diabetes. The report is restricted to persons studied in phase two of the San Antonio Heart Study, since postglucose load serum insulin concentrations were measured only in this phase. These analyses are also restricted to Mexican Americans, a population at high risk for noninsulin dependent diabetes mellitus (NIDDM) since the persons without diabetes in this population are likely to include a large number of persons with a parental history of diabetes, and therefore, a large number of prediabetic persons. Blood specimens were drawn after a 12-hour fast for determination of plasma glucose, serum insulin, and lipid and lipoprotein concentrations. A 75-gram glucose equivalent load was administered in the morning, and blood specimens were drawn after 30, 60, and 120 minutes for determination of plasma glucose and serum insulin. Other measurements taken included systolic and diastolic blood pressures, waist and hip circumferences, and body mass index (BMI). The study used the ratio of waist-to-hip circumference (WHR) as a measure of upper body adiposity. Researchers subtracted patients' self-reported weight at age 20 from the patients' current weight to calculate weight change. Compared to persons without a parental history of diabetes, those with such a history had a more atherogenic pattern of cardiovascular risk factors, including higher BMI, higher systolic and diastolic blood pressures, higher serum insulin and triglyceride concentrations, and lower levels of high density lipoprotein cholesterol. 2 tables, 57 references.

See also 040, 062, 069, 073, 104

Defining the Burden: Sizing the Problem of Diabetes Among Hispanics/Latinos

Risk and protective factors for NIDDM

Impaired glucose tolerance and hyperinsulinemia

116

Cardiovascular Risk Factors and Impaired Glucose Tolerance: The San Luis Valley Diabetes Study.

Form: Journal article.
Author: Burchfiel, C.M.; Hamman, R.F.; Marshall, J.A.; Baxter, J.; Kahn, L.B.; Amirani, J.J.
Source: *American Journal of Epidemiology.* 131(1):57-70, January 1990.

Abstract: In 1984-1986, researchers examined cardiovascular risk factors in 856 Hispanic and Anglo persons aged 20-74 years enrolled in the San Luis Valley Diabetes Study of Colorado. Researchers compared risk factor levels and prevalence for 279 cases with noninsulin dependent diabetes mellitus (NIDDM), 89 controls (persons reporting never having been told by a physician that they had diabetes) found during the study's physical examination to have impaired glucose tolerance, and 488 controls with normal glucose tolerance. Sex-specific comparisons of continuous risk factors were made by diabetes status and ethnicity, adjusting for age using two-way analysis of covariance. Similar comparisons of discrete variables were made using logistic regression. Ethnicity was defined by a response to the 1980 U.S. Census question: Are you of Hispanic or Spanish origin or descent? Researchers measured participants' (1) serum insulin, (2) uric acid, (3) total serum cholesterol, (4) high and low density lipoproteins (HDL and LDL), and (5) serum triglycerides. Using a standard mercury sphygmomanometer with a pediatric or adult cuff of appropriate size, systolic and fifth-phase diastolic blood pressures were auscultated from the right arm after participants rested supine for 5 minutes. Three measurements were taken, and the mean of the second and third was used. A history of hypertension was defined as a self-report of having been told by a doctor that one had high blood pressure, excluding the pregnancy period for women. Body mass index (BMI) was calculated by dividing weight in kilograms by height in meters squared. Researchers interviewed participants to determine (1) family history of myocardial infarction, (2) physical activity levels, and (3) smoking history. A score derived from an abbreviated version of the Jenkins Activity Survey was categorized to create a variable indicative of Type A personality. In general, biologic risk factors tended to be more strongly associated with diabetes status, while lifestyle risk factors varied more by ethnicity. Persons with NIDDM and those with impaired glucose tolerance had a significantly higher prevalence of hypertension by history than did control participants. Males with NIDDM reported a significantly lower prevalence of physical activity at work than males with normal glucose tolerance. A history of hypertension was significantly less frequent in Hispanic males than in white males; prevalence of Type A personality was higher and current smoking lower among whites than Hispanics. Hispanics were significantly less active than whites and had greater central obesity. Age-adjusted levels of systolic and diastolic blood pressure, hypertension history, triglycerides, and BMI were lowest among control participants. 6 tables, 57 references.

117

Diabetes and Impaired Glucose Tolerance in Women Aged 20-39 Years.

Form: Journal article.
Corporate Author: World Health Organization, Ad Hoc Diabetes Reporting Group.
Source: *World Health Statistics Quarterly.* 45(4):321-327, 1992.

Abstract: Researchers from the World Health Organization (WHO) present standardized data on glucose tolerance for women of childbearing age in 29 diverse population groups in 19 countries. Age of participants ranged from 20 to 39 years. The WHO diagnostic criteria for impaired glucose tolerance (IGT) was greater than or equal to 7.8 but less than 11.1 mmol/L venous plasma glucose concentration; the WHO diagnostic criteria for diabetes mellitus was greater than or equal to 11.1 mmol/L venous plasma glucose concentration. The principal criteria for inclusion were that (1) each subject in a valid population sample should have received a 75 g oral glucose (anhydrous, or its equivalent) challenge after a suitable period of fasting and (2) the blood glucose concentration should have been measured exactly 2 hours later. Results showed that in most populations, diabetes mellitus was uncommon (less than 1 percent) among women in this age range. These populations included Bantu (United Republic of Tanzania), Chinese (Singapore), rural Indian and Sri Lankan women, and some rural Pacific populations. Prevalence of diabetes mellitus in the range of 1-3 percent was observed in Italian women and in white, African-American, and Hispanic women in the United States. The prevalence of diabetes mellitus was more than 7 percent in rural Indian women on Fiji and in Aboriginal Australian women. The highest prevalence was observed in the Pima/Papago Indians in the United States and in Nauruans. The prevalence of IGT was low (less than 3 percent) only in Chinese and Malays, Mapuche Indians (Chile), and in some rural Pacific populations. Prevalence of IGT exceeded 10 percent in African-American and Hispanic women in the United States, urban Indian women in the United Republic of Tanzania, Pimas and Nauruans, and some other Pacific communities. 2 figures, 2 tables, 25 references.

118

Global Estimates for Prevalence of Diabetes Mellitus and Impaired Glucose Tolerance in Adults.

Form: Journal article.
Corporate Author: World Health Organization, Ad Hoc Diabetes Reporting Group.
Author: King, H.; Rewers, M.
Source: *Diabetes Care.* 16(1):157-177, January 1993.

Abstract: Researchers at the World Health Organization (WHO) evaluated standard estimates of abnormal glucose tolerance among adults in diverse communities worldwide and considered guidelines for the derivation of comparable estimates in future epidemiological studies. Letters were sent to a total of 35 investigators thought to possess data that would fulfill the study's criteria; materials were received for 75 diverse population groups or subgroups in 32 countries. The essential criteria were that each individual participant in a valid population sample had received a 75- gram oral glucose load after a suitable period of fasting, and that the blood or plasma glucose concentration was measured exactly 2 hours later. The project was limited to population-based investigations that had used current WHO criteria for diagnosis and classification of abnormal glucose tolerance. The raw data sent by investigators consisted of counts of individuals with normal glucose tolerance, impaired glucose tolerance, and diabetes. Individuals with diabetes were categorized into newly or previously diagnosed groups. Because large differences in age occurred in the study populations, researchers used a truncated age range of 30 to 64 years to provide the optimal

standardized comparison between such diverse populations. Results showed that wide variations existed in the prevalence of diabetes in all regions. Low prevalences (less than 3 percent) were seen in the least developed communities, including residents of rural Bantu, Chile, and Tanzania; rural Dravidian women in southern India; rural Sri Lankan women; Mapuche Indians; rural Melanesians in Papua New Guinea; and New Caledonian men. Rates were also low in Da Qing in northwestern China, an industrial community of 500,000. Moderate prevalences (3 to 10 percent) were observed in Tunisians; rural Dravidian and Sri Lankan men; Malays; Singapore Chinese; Thais; non-Hispanic whites, African-American men, and rural and upper income urban Hispanics in the United States; Brazilians; Colombians; European populations; most urban Melanesian populations; and most Polynesian populations. High prevalences (11 to 20 percent) were seen in Arab Omanis, urban Dravidians in Madras, migrant Asian Indian populations in South Africa, Asian Indians, Creole and Chinese populations in Mauritius, Asian Indian women, Malays in Singapore, African-American women and most Hispanic groups in the United States, and the urban Micronesians of Kiribati. The highest prevalences were found in the Nauruans (41 percent) and the Pima/Papago Indians (50 percent). Prevalence of diabetes rose with age in all populations in which age-specific data were examined. Findings indicate that diabetes is a global health problem, and populations of developing nations, minority groups, and disadvantaged communities in industrialized countries now face the greatest risk. 4 figures, 17 tables, 65 references.

119

Hyperinsulinemia as a Possible Etiology for the High Prevalence of Non Insulin Dependent Diabetes in Mexican Americans.

Form: Journal article.
Author: Haffner, S.M.
Source: *Diabete et Metabolisme.*
13(3, Supplement):337-344, July 1987.

Abstract: Researchers extend the findings of a smaller previous study that showed that Mexican Americans are more hyperinsulinemic than non-Hispanic whites even after adjustment for body mass index (BMI), waist-to-hip ratio (WHR), subscapular-to-triceps skinfold ratio, and glucose tolerance. The present study confirmed the findings in 1,182 participants as compared to 407 participants for the original report. Researchers examined three additional questions: (1) Does the effect of overall obesity and upper body obesity differ in high and low risk populations for NIDDM?; (2) is there evidence of bimodality of insulin concentrations in Mexican Americans?; and (3) are there differences in sex hormone concentrations which might explain differences in glucose tolerance and hyperinsulinemia between Mexican Americans and non-Hispanic whites? The report concerns individuals who participated in phase II of the San Antonio (Texas) Heart Study that began in October 1984. An initial interview was carried out in participants' homes and a medical examination was performed in a mobile clinic located in participants' neighborhoods. The report is based on 986 Mexican Americans without diabetes and 196 non-Hispanic whites without diabetes for whom serum insulin levels were available. A table presents the age-adjusted means and 95 percent confidence intervals for BMI, centrality index, WHR, fasting glucose, glucose sum, fasting insulin, and insulin sum according to sex and ethnicity. Except for fasting glucose, all of these variables were higher in Mexican Americans than in non-Hispanic whites in both sexes. 1 figure, 5 tables, 37 references.

120

Hyperinsulinemia in a Population at High Risk for Non-Insulin-Dependent Diabetes Mellitus.

Form: Journal article.
Author: Haffner, S.M.; Stern, M.P.; Hazuda, H.P.; Pugh, J.A.; Patterson, J.K.
Source: *New England Journal of Medicine.* 315(4):220-224, July 24, 1986.

Abstract: Researchers performed oral glucose tolerance tests with measurements of serum insulin concentrations among 225 Mexican Americans and 180 non-Hispanic whites without diabetes as part of the San Antonio (Texas) Heart Study. Because only data on fasting serum insulin levels are available from phase one of the San Antonio Study, the present study concerns individuals who participated in phase two, which began in October 1984. Researchers conducted an initial interview in the participant's home and performed a medical examination in a mobile clinic in the participant's neighborhood. The study defined Mexican Americans as persons whose ancestry and cultural traditions were principally Mexican. Researchers developed an algorithm that examined the concordance between (1) the father's surname and the mother's maiden name, (2) the birthplace of both parents, (3) the respondent's preferred ethnic identity when it indicated a unique national origin, and (4) the stated ethnic background of all four grandparents. Blood samples were drawn after a 12-hour fast to determine plasma glucose and serum insulin levels. A 75-gram oral load of a glucose equivalent was then administered, and blood samples were drawn 30, 60, and 120 minutes later to determine plasma glucose and serum insulin concentrations. Researchers made anthropometric measurements including (1) height, (2) weight, (3) subscapular and triceps skin folds, (4) waist and hip circumferences, and (5) body mass index (BMI). The study diagnosed diabetes mellitus according to the plasma glucose criteria of the National Diabetes Data Group. Changes in serum insulin concentrations in response to the glucose challenge were quantified by the area under the serum insulin curve. Adjusted means were computed by two-way and three-way analysis of covariance. The dependent variables were fasting insulin concentration and area under the curve for serum insulin concentration. Ethnic classification was the principal independent variable of interest, and BMI, centrality index, waist-to-hip ratio, and glucose-area group were regarded as potentially confounding variables. Overall adiposity was characterized by BMI, and regional body fat distribution by the ratio of subscapular to triceps skin folds and the ratio of waist to hip circumference. After adjustment for these indicators of adiposity and also for differences in glucose tolerance, Mexican Americans had significantly greater areas under the serum insulin curve than did non-Hispanic whites. 3 tables, 33 references.

121

Increased Insulin Concentrations in Nondiabetic Offspring of Diabetic Parents.

Form: Journal article.
Author: Haffner, S.M.; Stern, M.P.; Hazuda, H.P.; Mitchell, B.D.; Patterson, J.K.
Source: *New England Journal of Medicine.* 319(20):1297-1301, November 17, 1988.

Abstract: Researchers assessed serum insulin concentrations in a cohort of 1,497 Mexican Americans without diabetes, a population at high risk for noninsulin dependent diabetes mellitus (NIDDM), according to whether their parents or siblings had diabetes. Participants were interviewed and medically examined. Participants were asked the total number of their siblings and whether their father, mother, or any siblings had diabetes. Researchers drew blood samples after a 12-hour fast to determine concentrations of plasma glucose and serum insulin. Participants then drank a 75-gram load of a glucose equivalent and gave blood samples 30, 60, and 120 minutes later for determination of plasma glucose and serum insulin levels. Researchers made anthropometric measurements for height/weight and subscapular and triceps skin folds. They measured waist circumference at the level of the umbilicus, and hip circumference at the level of the greater trochanter. They calculated body mass index (BMI) as weight in kilograms divided by height in meters squared. The ratio of waist to hip circumference was chosen as a measure of upper body adiposity, and the ratio of subscapular to triceps skin fold was chosen as a measure of central adiposity. Unadjusted group means were computed by analysis of variance and covariance, respectively, with family history as the grouping variable. Both fasting insulin and the sum of all four insulin concentrations during the glucose-tolerance test were examined separately as dependent variables. Age, body mass index, ratio of waist to hip circumference, centrality index, and fasting glucose levels were regarded as potential confounding variables. Results showed a stepwise increase in fasting insulin levels in persons without diabetes with neither, one, or both parents with diabetes. Similar results were observed for insulin sum, the total of insulin concentrations in the fasting state and at 30, 60, and 120 minutes after a 75-gram oral glucose load. 2 tables, 57 references.

122

Predicting Diabetes: Moving Beyond Impaired Glucose Tolerance.

Form: Journal article.
Author: Stern, M.P.; Morales, P.A.; Valdez, R.A.; Monterrosa, A.; Haffner, S.M.; Mitchell, B.D.; Hazuda, H.P.
Source: *Diabetes.* 42(5):706-714, May 1993.

Abstract: Researchers developed predictive models for noninsulin dependent diabetes mellitus (NIDDM) using stepwise multiple logistic regression analyses of a cohort of 844 Mexican Americans and 641 non-Hispanic whites who did not have diabetes at baseline and who were then followed for 8 years. Researchers used data from the San Antonio (Texas) Heart Study of diabetes and cardiovascular disease in Mexican Americans and non-Hispanic whites. A number of variables were considered as possible risk factors for NIDDM. These included 5 categorical variables (ethnicity, sex, impaired glucose tolerance, hypertension, and hyperdynamic circulation) and 14 continuous variables (age, body mass index, subscapular/triceps ratio, fasting and 2-hour plasma glucose, fasting serum insulin, fasting serum total, low-density lipoprotein (LDL) and high-density lipoprotein (HDL) cholesterol, fasting serum triglycerides, systolic blood pressure, diastolic blood pressure, pulse pressure, and heart rate). The performance of impaired glucose tolerance as a risk factor for future NIDDM was used as a benchmark against which the other predicting models were evaluated. Optimal predicting models for the 8-year incidence of NIDDM were generated by stepwise multiple linear regression analyses. Models were developed for the entire population as well as for each sex and ethnic specific subpopulation. In addition to the optimal models, a series of reduced predicting models were evaluated that were based on a restricted list of potential risk factors. To assess the performance of the logistic regression models, each individual's 8-year risk of developing NIDDM was computed from individual risk factor values at baseline and the parameter estimates of the model. Participants were ranked in ascending order of risk. Individuals in the top 15 percent of the continuum were defined as high risk. The relative risk of being high risk ranged from 12.16 to 35.29, whereas the relative risk of having impaired glucose tolerance ranged from 7.11 to 10.0. Participants with impaired glucose tolerance were eight times more likely to develop diabetes in 8 years than those who had normal glucose tolerance at baseline. The sensitivity of the multiple logistic regression models ranged from 67.7 to 83.3 percent compared with 56.5 to 62.1 percent for impaired glucose tolerance. 7 tables, 35 references.

123

Reproductive History, Glucose Tolerance, and NIDDM in Hispanic and Non-Hispanic White Women: The San Luis Valley Diabetes Study.

Form: Journal article.
Author: Alderman, B.W.; Marshall, J.A.; Boyko, E.J.; Markham, K.A.; Baxter, J.; Hamman, R.F.
Source: *Diabetes Care.* 16(12):1557-1564, December 1993.

Abstract: Researchers sought to ascertain whether childbearing would decrease oral glucose-stimulated insulin and C-peptide levels and increase the risk of noninsulin dependent diabetes mellitus (NIDDM) and impaired glucose tolerance in a population of Hispanic and non-Hispanic white women residing in the San Luis Valley of Colorado. They identified patients diagnosed with diabetes between 1984 and 1988 by a periodic review of transaction and discharge summaries for all practices and health-care facilities in the study area, ongoing physician referral, ongoing self-referral, and local public advertisements and presentations. Of 293 eligible case women identified, 240 participated in the study. Control women were randomly sampled by a geographically based multistage process. After giving informed consent, participants attended a study clinic for an oral glucose tolerance test, interview, and physical examination. Participants who reported at least an 8-hour fast gave a fasting blood sample, drank a flavored, carbonated, noncaffeinated drink containing 75 grams of glucose, and then gave blood samples 1 and 2 hours later. Trained interviewers administered a standard interview that included questions on potential determinants of glucose, insulin, and C-peptide concentrations such as (1) demographic characteristics; (2) family history of diabetes; (3) body weight at age 20 years; (4) maximum weight; and (5) numbers of live and nonlive births including abortions, miscarriages, and stillbirths. Two trained observers collected information on (1) height; (2) body weight; (3) arm, waist, iliac, and thigh circumferences; and (4) triceps, subscapular, suprailiac, and lateral calf skin-fold thicknesses. Multiple regression methods were used to examine the effects of the live-birth number on each outcome. After accounting for the effects of age, ethnicity, county of residence, and body fat, childbearing was related to lower C-peptide and insulin levels among Hispanic and non-Hispanic women of the San Luis Valley. It had little apparent effect on later risk of NIDDM or impaired glucose tolerance. 3 figures, 4 tables, 35 references.

See also 011, 059, 109

Risk and protective factors for NIDDM

Other

124

Diabetes Mellitus and Cigarette Smoking: Findings From the 1989 National Health Interview Survey.

Form: Journal article.
Author: Ford, E.S.; Malarcher, A.M.; Herman, W.H.; Aubert, R.E.
Source: *Diabetes Care.* 17(7):688-692, July 1994.

Abstract: Using data from the 1989 National Health Interview Survey (NHIS), researchers compared the prevalence of current smoking among persons with diabetes with a normoglycemic population. They also examined the association of the type of diabetes and duration of the disease with smoking status among people with diabetes. They calculated the prevalence of current smoking for 2,405 people with self-reported diabetes and 20,131 normoglycemic people. In 1989, a total of 45,711 households were contacted. All people who were identified by the household respondent as having diabetes and who confirmed this information were asked to complete the Diabetes Supplement. The supplement queried respondents about various aspects of diabetes and about diabetes risk factors. A sample of respondents also completed the Diabetes Risk Factor Supplement, which contained questions that were similar to those on the Diabetes Supplement. Participants were defined as having insulin dependent diabetes mellitus (IDDM) if the onset of diabetes occurred when they were 29 years of age or younger, if insulin use started within 1 year of the onset of diabetes, and if body mass index was less than 27 kilograms per square meter for men and less than 25 kilograms per square meter for women. All other participants with self-reported diabetes were classified as having noninsulin dependent diabetes mellitus. Investigators used multiple-logistic regression analyses and the RTILOGIT procedure. Estimates for people with diabetes were derived from the Diabetes Supplement and estimates for people without diabetes were derived from the Diabetes Risk Factor Supplement. Data analysis of responses from 2,405 persons with self-reported diabetes reveals that people with diabetes were older, less educated, more likely to be female, and more likely to be African American. Overall, the age-adjusted prevalence of smoking was 27.3 percent among people with diabetes and 25.9 among people without diabetes. The prevalence of smoking did not differ significantly between participants with and without diabetes when they were stratified by age, sex, race, or education. African American and Hispanic men with diabetes had a higher prevalence of smoking than did white men with diabetes and African American and Hispanic men without diabetes, but none of these differences were statistically significant. Among people with diabetes, age, race, sex, and educational status were independent predictors of current smoking in a multiple-logistic regression model. Duration of diabetes was not related to smoking. 4 tables, 9 references.

See also 123

Defining the Burden: Sizing the Problem of Diabetes Among Hispanics/Latinos

Diabetes complications

Cardiovascular disease

125

Cardiovascular Risk Factors in Confirmed Prediabetic Individuals: Does the Clock for Coronary Heart Disease Start Ticking Before the Onset of Clinical Diabetes?

Form: Journal article.
Author: Haffner, S.M.; Stern, M.P.; Hazuda, H.P.; Mitchell, B.D.; Patterson, J.K.
Source: *Journal of the American Medical Association (JAMA).* 263(21):2893-2898, June 6, 1990.

Abstract: Researchers documented the cardiovascular risk factor status of 614 Mexican Americans initially without diabetes who later participated in an 8-year followup of the San Antonio (Texas) Heart Study. The followup examination consisted of an initial home or telephone interview and a medical examination performed in a mobile clinic located in the participant's neighborhood. At the followup examination, researchers measured plasma glucose in the fasting state and 2 hours after the administration of a 75-gram glucose equivalent load. The methods used for glucose, insulin, and anthropometric measurements were identical to those used in the baseline examination. Diabetes mellitus was diagnosed according to the criteria of the World Health Organization (WHO). Participants who did not meet the WHO plasma glucose criteria, but who were treated with oral antidiabetic agents or insulin as of the followup examination, were considered to have diabetes. Persons with diabetes who were not taking insulin were considered to have noninsulin dependent diabetes mellitus (NIDDM). Participants who were taking insulin, but whose age at onset of diabetes was greater than 40 years, and who had a body mass index greater than 30 kg/m squared were also considered to have NIDDM diabetes. Other persons with diabetes were considered to have insulin dependent diabetes mellitus (IDDM) or to be unclassifiable. Persons who had diabetes at baseline were excluded from the analyses. Age-adjusted; age- and BMI-adjusted; and age-, BMI-, and glucose-adjusted group means were computed by two-way analysis of covariance with sex and conversion to diabetes as the grouping variables. Individuals who were without diabetes at the time of baseline examination, but who subsequently developed NIDDM diabetes, had higher levels of total and low-density lipoprotein (LDL) cholesterol than individuals who remained without diabetes. Most of these differences persisted after adjustment for obesity or level of glycemia, but were abolished after adjustment for fasting insulin concentration. When persons with impaired glucose tolerance at baseline were eliminated from the analysis, the more atherogenic pattern of cardiovascular risk factors was still evident (and statistically significant) among initially normoglycemic prediabetic persons. These results indicate that prediabetic persons have an atherogenic pattern of risk factors (possibly caused by obesity, hyperglycemia, and especially hyperinsulinemia), which may be present for many years and may contribute to the risk of macrovascular disease as much as the duration of clinical diabetes itself. 5 tables, 46 references.

126

Cardiovascular Risk Factors in Mexican Americans in Laredo, Texas: I. Prevalence of Overweight and Diabetes and Distributions of Serum Lipids.

Form: Journal article.
Author: Stern, M.P.; Gaskill, S.P.; Allen, C.R.; Garza, V.; Gonzales, J.L.; Waldrop, R.H.
Source: *American Journal of Epidemiology.* 113(5):546-555, May 1981.

Abstract: From February to August 1979, researchers conducted an epidemiologic survey of cardiovascular risk factors using a random sample of 389 Mexican Americans (127 men and 262 women) living in two low-income census tracts in Laredo, Texas. A public health worker visited each house, administered a brief questionnaire, and measured the blood pressure three times of each eligible participant. Participants received an appointment at the health department for repeat blood pressure measurements and fasting blood work. The home interview inquired into previous diagnosis of diabetes and, if applicable, current treatment. At the clinic visit, each participant had his or her height and weight measured. Blood was drawn after a 12-hour fast, and plasma glucose concentration was determined by the glucose oxidase-peroxidase method. Serum cholesterol concentration was measured by the Lieberman-Burchard reaction, and serum triglyceride concentration was measured by the Hycel Triglyceride Test. Prevalence rates were age-adjusted to the 1970 national population as estimated by the U.S. Bureau of the Census. The prevalence of overweight in Laredo was determined according to criteria developed in the Health and Nutrition Examination Survey (HANES I). The prevalence of fasting hyperglycemia in Laredo Project Mexican Americans is compared with the rates reported for Pima Indians living in the Gila River Indian Community, Sacaton, Arizona, and with preliminary data from HANES II. The prevalence of being overweight for Mexican Americans was found to be intermediate between national estimates and the rates recorded for Pima Indians. Similarly, the prevalence of fasting hyperglycemia was intermediate between the rates observed in a sample of predominantly white persons as measured in the Lipid Research Clinics (LRC) Prevalence Study and those observed among Pima Indians. Triglyceride levels were substantially higher in Laredo Project Mexican Americans of both sexes than in LRC persons. The ethnic differences in triglyceride levels were particularly marked for women. 6 tables, 28 references.

127

Decreased Prevalence of Hypertension in Mexican-Americans.

Form: Journal article.
Author: Haffner, S.M.; Mitchell, B.D.; Stern, M.P.; Hazuda, H.P.; Patterson, J.K.
Source: *Hypertension.* 16(3):225-232, September 1990.

Abstract: Researchers compared the prevalence of hypertension using four different definitions in a population of 3,297 Mexican Americans and 1,873 non-Hispanic whites. While previous studies have shown that Hispanic Americans have a lower prevalence of hypertension, this result is unexpected because Hispanic-American populations tend to have a higher prevalence of both obesity and noninsulin dependent diabetes mellitus (NIDDM). Data were from the San Antonio (Texas) Heart Study, a population-based study of diabetes and cardiovascular disease that was conducted in two phases from 1979 to 1988. As part of the study, participants underwent physical examinations that evaluated body mass index, blood pressure, plasma glucose levels, and serum lipids. Diabetes was diagnosed according to the plasma glucose criteria of the National Diabetes Data Group. Researchers evaluated differences in mean age and body mass index between ethnic groups using two-way ANOVA; the effect of ethnicity on hypertension prevalence using multivariate models was also evaluated. The four different definitions used to assess hypertension prevalence included (1) diastolic blood pressure (DBP) greater than or equal to 95 or taking blood pressure medication, (2) systolic blood pressure (SBP) greater than or equal to 160 or taking blood pressure medication, (3) DBP greater than or equal to 95 or SBP greater than or equal to 160 or taking medication, and (4) mild hypertension (SBP greater than or equal to 140 or DBP greater than or equal to 90 or taking medication). Using the first three definitions, hypertension prevalence was lower among Mexican-Americans than among non-Hispanic whites in both sexes, although this deficit was statistically significant in only two of the six comparisons. There was little difference in the prevalence of mild hypertension between the two ethnic groups. Compared with non-Hispanic whites, Mexican-American participants were younger, more obese, and had a higher prevalence of NIDDM. 8 tables, 32 references.

128

Diabetes and Coronary Heart Disease Risk in Mexican Americans.

Form: Journal article.
Author: Mitchell, B.D.; Haffner, S.M.; Hazuda, H.P.; Patterson, J.K.; Stern, M.P.
Source: *Annals of Epidemiology.* 2(1-2):101-106, January-March 1992.

Abstract: To determine whether Mexican Americans might be more resistant to the atherogenic effects of diabetes than non-Hispanic whites, researchers examined the associations between diabetes and myocardial infarction and selected coronary heart disease (CHD) risk factors among these two ethnic groups. The study population consisted of 5,149 Mexican Americans and non-Hispanic whites aged 25-64 years and recruited from the San Antonio (Texas) Heart Study, a population-based study of cardiovascular risk factors and diabetes conducted between 1979 and 1988. The prevalence component of the San Antonio Heart Study was conducted in two phases: The first between 1979 and 1982 and the second between 1984 and 1988. Participants received an examination in a mobile clinic, at which time a 2-hour glucose tolerance test was administered and fasting blood samples were drawn to determine lipid and lipoprotein levels. Researchers obtained standard 12-lead electrocardiograms (ECG's) for all participants. The study diagnosed diabetes mellitus according to the plasma glucose criteria of the National Diabetes Data Group. The age-adjusted prevalence of myocardial infarction was calculated at the mean age of the cohort (43.9 years) using multiple logistic regression, and age-adjusted prevalence rate ratios were computed to estimate the association between diabetes and myocardial infarction within each sex-ethnic group. Age-adjusted cell means for selected CHD risk factors were obtained for participants with and without diabetes separately by analysis of covariance, and the effect of diabetes on each of these variables was computed as the adjusted mean in persons with diabetes minus the adjusted mean in persons without diabetes. Men with diabetes were more than twice as likely to have an ECG-documented myocardial infarction than were men without diabetes, although women with diabetes were more than three times as likely to have a myocardial infarction than were women without diabetes. There was no evidence that the association between diabetes and either myocardial infarction or conventional cardiovascular risk factors differs between Mexican Americans and non-Hispanic whites. 3 tables, 17 references.

129

Eight-Year Incidence of Hypertension in Mexican-Americans and Non-Hispanic Whites: The San Antonio Heart Study.

Form: Journal article.
Author: Haffner, S.M.; Mitchell, B.D.; Valdez, R.A.; Hazuda, H.P.; Morales, P.A.; Stern, M.P.
Source: *American Journal of Hypertension.* 5(3):147-153, March 1992.

Abstract: Researchers report the 8-year incidence of hypertension in Mexican Americans and non-Hispanic whites examined in the San Antonio (Texas) Heart Study, a population-based study of diabetes and cardiovascular disease. From 1979 to 1982, researchers randomly sampled households from several San Antonio census tracts: Two low-income (barrio) census tracts (99 percent of the residents were Mexican American), two middle income (transitional) census tracts (60 percent of the residents were Mexican American), and a cluster of high income (suburban) census tracts (10 percent of the residents were Mexican American). Stratified random sampling was used in the transitional and suburban census tracts to ensure the inclusion of approximately equal numbers from each ethnic group. All men and nonpregnant women aged 25-64 years were eligible for the study. At the baseline examination, blood specimens were obtained and diabetes diagnosed according to the National Diabetes Data Group plasma glucose criteria; individuals who did not meet the criteria but were currently under treatment with either oral antidiabetic agents or insulin were also considered to have diabetes. Height, weight, subscapular and triceps skin folds, body mass index (BMI), blood pressure, and level of educational attainment were determined. The sample group included 1,462 individuals (867 Mexican Americans and 592 non-Hispanic whites) who were normotensive at baseline and who subsequently participated in the 8-year followup of the San Antonio Heart Study. Followup included an interview and a medical examination that consisted of anthropometric and blood pressure measurement. Researchers used two-way analysis of variance, the Mantel-Haenszel technique, the chi-square statistic (with Yates correction for continuity), and logistic regression for data analyses. They evaluated differences in mean age and BMI between ethnic groups; calculated summary odds ratios for ethnic differences in hypertension incidence adjusted for age, BMI, noninsulin dependent diabetes mellitus (NIDDM), or educational attainment; and evaluated differences in the proportion of persons on antihypertensive therapy by ethnic group. Results showed that the incidence of hypertension was lower among Mexican-American men than among non-Hispanic white men, but higher among Mexican-American women than among non-Hispanic white women, although neither of these differences was statistically significant. Compared with non-Hispanic whites, Mexican Americans were younger, more obese, and had a higher prevalence of NIDDM. In both sexes, age and BMI were significantly related to hypertension. Among incident hypertensive cases, Mexican-American men were slightly less likely to be on antihypertensive therapy than were non-Hispanic white men; among women, there were no differences in the percent on therapy. Hypertension is an important risk factor for complications from diabetes, and although the Mexican-American population in this study showed a lower incidence of it than expected, hypertension undoubtedly has a major public health impact on this ethnic group. 2 tables, 39 references.

130

Essential Hypertension: An Insulin-Resistant State.

Form: Journal article.
Author: Ferrannini, E.; Haffner, S.M.; Stern, M.P.
Source: *Journal of Cardiovascular Pharmacology.* 15(Supplement 5): S18-S25, 1990.

Abstract: Researchers reviewed the similarities and differences among hypertension, diabetes, and obesity. Obesity, noninsulin dependent diabetes mellitus (NIDDM), and, to a lesser extent, hypertension, impaired glucose tolerance, and hypertriglyceridemia are all frequently associated with elevated plasma insulin levels. Therefore, they hypothesized that the basis for the association of hypertension with a multitude of metabolic diseases is the sharing of a common factor, hyperinsulinemia. The San Antonio (Texas) Heart Study, a population-based study of diabetes and cardiovascular disease among Hispanic Americans and non-Hispanic whites, found an association between relatively high insulin concentrations and the presence of one or more of the diseases in question (e.g., obesity, diabetes, impaired glucose tolerance, and hypercholesterolemia). In the study population, all of the physiological and metabolic characteristics that were examined were significantly altered in the 278 participants with hypertension, compared with the 2,627 normotensive members of the same cohort. Both glucose tolerance and blood pressure are under genetic control. NIDDM and essential hypertension run in families, as do obesity and dyslipidemia. It is therefore possible that the entire set of variables being examined (glucose tolerance, blood pressure, obesity, and plasma insulin and lipids) is, at least in part, under genetic influence as a cluster or network. 9 figures, 4 tables, 26 references.

131

Family Health Project: Cardiovascular Risk Reduction Education for Children and Parents.

Form: Journal article.
Author: Nader, P.R.; Baranowski, T.; Vanderpool, N.A.; Dunn, K.; Rosalind, D.; Ray, L.
Source: *JDBP. Journal of Developmental and Behavioral Pediatrics.* 4(1):3-10, March 1983.

Abstract: The principles of family support and of social learning theory were applied to a feasibility study of working directly with family units in a health education program. Twenty-four white, black, and Mexican-American families of young elementary school children participated in a 3-month cardiovascular risk reduction education project. The eight weekly evening sessions were designed to assist families in decreasing the consumption of foods high in sodium and saturated fats while increasing the frequency of aerobic exercise. Statistically significant differences were noted between randomly assigned treatment groups and control groups for reported consumption of foods high in sodium and foods high in saturated fats. Experimental subjects gained more knowledge of factors influencing cardiovascular risk, even though the intervention was behaviorally based rather than cognitively based. This method of health promotion is deserving of further study. 30 references.

132

Macrovascular Complications in Mexican Americans With Type II Diabetes.

Form: Journal article.
Author: Haffner, S.M.; Mitchell, B.D.; Stern, M.P.; Hazuda, H.P.
Source: *Diabetes Care.*
14(7, Supplement 3):665-671, July 1991.

Abstract: Researchers examined the prevalence of peripheral vascular disease and self-reported myocardial infarction among Mexican Americans and non-Hispanic whites with noninsulin dependent diabetes mellitus (NIDDM). The study diagnosed diabetes mellitus according to the plasma glucose criteria of the National Diabetes Data Group. Persons with diabetes from phases I and II of the San Antonio (Texas) Heart Study were recontacted and asked to participate in a diabetes complications examination (retinopathy, proteinuria, peripheral vascular disease, and functional status examination) beginning in 1984. For phase I participants, the complications examination took place between 2 and 6 years after their initial San Antonio Heart Study examination. Phase II participants were asked to participate as soon as their diabetes status was confirmed. Researchers made anthropometric measurements of height, weight, and body mass index. Blood samples were drawn after a 12-hour fast for serum lipid and lipoprotein determinations. Researchers took three readings of systolic and diastolic blood pressure on each individual, and the average of the second and third reading was defined as the patient's blood pressure. Researchers interviewed participants to obtain smoking information and history of previous myocardial infarction. Vascular evaluation of the lower extremities included measurement of the ankle and arm systolic blood pressures by an ultrasonic Doppler. Age-adjusted means for clinical characteristics of participants with diabetes were calculated according to ethnic group and sex. The presence or absence of an ethnic or sex effect in each clinical characteristic was evaluated by either the chi-square test or linear regression analysis. Mexican Americans with diabetes have only a moderate excess of peripheral vascular disease as judged by ankle-arm blood pressure ratios relative to non-Hispanic whites with diabetes. Mexican Americans with diabetes actually reported fewer myocardial infarctions than did non-Hispanic whites with diabetes. 4 tables, 39 references.

133

Prevalence of Coronary Heart Disease in Subjects With Normal and Impaired Glucose Tolerance and Non-insulin-dependent Diabetes Mellitus in a Biethnic Colorado Population: The San Luis Valley Diabetes Study.

Form: Journal article.
Author: Rewers, M.; Shetterly, S.M.; Baxter, J.; Marshall, J.A.; Hamman, R.F.
Source: *American Journal of Epidemiology.*
135(12):1321-1330, June 15, 1992.

Abstract: Researchers studied the prevalence of coronary heart disease in 1,092 individuals with normal glucose tolerance, 173 individuals with impaired glucose tolerance, and 429 individuals with noninsulin dependent diabetes mellitus (NIDDM). Participants were aged 25-74 years and were from a biethnic community in the San Luis Valley, Colorado. A table presents data for the study population by sex, age, ethnicity, and diabetes status. The study used a standard 75-gram oral glucose tolerance test and the World Health Organization (WHO) criteria to classify glucose tolerance. Fasting 1-hour and 2-hour postglucose load plasma blood glucose levels were measured by the glucose oxidase method. A 4-hour morning clinic included a standardized physical examination and face-to-face interviews conducted in English or Spanish. A table presents the coronary heart

disease end points used by the study. A standard 12-lead resting electrocardiogram was performed according to the 1982 Minnesota protocol, and readings were coded by the University of Minnesota ECG Coding Center, blind to diabetes status, sex, or ethnicity. Researchers assessed smoking history by a standard questionnaire. They took measurements for body mass index (BMI) and for systolic and diastolic blood pressures. Total and high density lipoprotein (HDL) cholesterol levels were determined enzymatically. Compared with normal glucose tolerance, coronary heart disease was significantly more prevalent in non-Hispanic white women and men with diabetes and in Hispanic women with diabetes. Among men with diabetes, the prevalence of possible myocardial infarction was lower in Hispanics than in non-Hispanic whites. Similar patterns of coronary heart disease were observed in individuals with impaired glucose tolerance. 6 tables, 40 references.

See also 040, 095, 104, 115, 116

Defining the Burden: Sizing the Problem of Diabetes Among Hispanics/Latinos

Diabetes complications

Metabolic disturbances (diabetic ketoacidosis, hypoglycemia)

134

Relationship of Sex Hormones to Hyperinsulinemia and Hyperglycemia.

Form: Journal article.
Author: Haffner, S.M.; Katz, M.S.; Stern, M.P.; Dunn, J.F.
Source: *Metabolism: Clinical and Experimental.* 37(7):683-688, July 1988.

Abstract: Researchers measured total testosterone, total estradiol and sex-hormone-binding globulin (SHBG), glucose, and insulin in premenopausal women as part of the San Antonio (Texas) Heart Study. The purpose of the study was to examine whether, in premenopausal women, (1) decreased SHBG is associated with an unfavorable pattern of diabetes risk factors; (2) the relationship between SHBG, glucose, and insulin could be mediated by obesity and body fat distribution; and (3) the lower levels of SHBG in Mexican-Americans might be a possible explanation for hyperinsulinemia in this ethnic group. The study used a subsample from the San Antonio Heart Study consisting of 96 premenopausal women (58 Mexican-American and 38 non-Hispanic white) aged 25-54 years, residing in a middle-income neighborhood. The study considered participants to be premenopausal if their last menstrual period was less than 60 days prior to their clinic visit, and if they had at least 10 menstrual periods in the preceding year. Women who reported having had a hysterectomy or an oophorectomy, or who reported taking oral contraceptives or estrogens were excluded. SHBG was measured by the dextran-coated charcoal method described by Hammond and Lahteenmaki. Total testosterone was measured by a coated-tube commercial radioimmunoassay, and total estradiol was measured by a commercial double antibody radioimmunoassay. Although total estradiol and total testosterone were, in general, not correlated with metabolic variables, SHBG was negatively correlated with glucose and insulin. 3 figures, 4 tables, 30 references.

See also 011, 057

Defining the Burden: Sizing the Problem of Diabetes Among Hispanics/Latinos

Diabetes complications

Nephropathy (end-stage renal disease)

135

Diabetes Mellitus After Renal Transplantation in the Cyclosporine Era: An Analysis of Risk Factors.

Form: Journal article.
Author: Sumrani, N.B.; Delaney, V.; Ding, Z.; Davis, R.; Daskalakis, P.; Friedman, E.A.; Butt, K.M.; Hong, J.H.
Source: *Transplantation.* 51(2):343-347, February 1991.

Abstract: Researchers examine the characteristics of cyclosporine-treated renal allograft recipients who developed diabetes mellitus following transplantation. Records of all renal allograft recipients at the State University of New York Health Science Center from June 1983 through December 1988 were reviewed. Researchers analyzed a total of 337 adult recipients without diabetes, whose pretransplant fasting blood glucoses were normal (80-120 mg/dL) and whose allografts functioned longer than 1 year. Living related-donor renal allograft recipients received cyclosporine and tapering doses of prednisone. From 1983-1987, all cadaver donor renal transplant recipients received cyclosporine together with prednisone; this protocol was subsequently confined to patients with good initial function. Those with delayed initial function received prophylactic antilymphocyte globulin AFG or monoclonal antibody OKT3. Researchers diagnosed acute rejection by standard clinical criteria and a rise in serum creatinine. They also noted the incidence, requirement for insulin, and time of onset of diabetes posttransplant. Results showed that of the 337 transplant recipients whose grafts survived 1 year, 39 (11.6 percent) developed posttransplant diabetes mellitus (PTDM). The most frequent presentation of PTDM was an elevated blood glucose level during a routine followup visit. Insulin and oral hypoglycemic agents were required in 20 (51.3 percent) and 13 (33.3 percent) recipients, respectively. PTDM developed in 34 of 243 (14 percent) cadaveric renal allograft recipients, compared with 5 of 94 (5.3 percent) living related donor allograft recipients. The incidence of PTDM was 19.8 percent in African Americans, 21.3 percent in Hispanic Americans, and 3.6 percent in whites. 2 figures, 3 tables, 35 references.

136

End-Stage Renal Disease in U.S. Minority Groups.

Form: Journal article.
Author: Feldman, H.I.; Klag, M.J.; Chiapella, A.P.; Whelton, P.K.
Source: *American Journal of Kidney Diseases.* 19(5):397-410, May 1992.

Abstract: A literature review presents issues in relation to the major identifiable United States racial groups suffering from end-stage renal disease (ESRD): (1) Whites, (2) African Americans, (3) Native Americans, and (4) Hispanics. No health status monitoring system identifies all patients developing ESRD. Assessment of the incidence of irreversible renal failure is best estimated by the rate of administration of renal replacement therapy. The Health Care Financing Administration's (HCFA) Program Management Medical Information System (PMMIS) provides the most reliable measure of race-specific national ESRD data for

Medicare beneficiaries. The African American population has consistently suffered from a rate of treated ESRD that is over 3.5 times higher than that of the white population. The rates of hypertensive, diabetic, and glomerulopathic ESRD are all substantially greater among African Americans than among whites, and hypertension has accounted for a far greater proportion of ESRD among African Americans than any other diagnosis. There is a paucity of national data on the occurrence of ESRD among Hispanic Americans. However, data from Texas strongly suggest that the incidence rate of treated ESRD is much higher among Mexican Americans than among non-Hispanic whites. Higher rates are apparent for each of the three most important causes of ESRD: (1) Hypertension, (2) diabetes, and (3) glomerulonephritis. Native Americans develop ESRD at a rate intermediate to that of whites and African Americans, but their rate of diabetic ESRD is higher than in either African Americans or whites. However, considerable diversity exists among Native American tribal groups. Some Hispanic groups have been observed to experience great excesses of diabetic ESRD as compared with non-Hispanic whites. Mexican Americans appear to suffer from excess diabetic renal disease and to develop approximately twice as much hypertensive ESRD as do whites. 6 figures, 2 tables, 62 references.

137

Excess Incidence of Treatment of End-Stage Renal Disease in Mexican Americans.

Form: Journal article.
Author: Pugh, J.A.; Stern, M.P.; Haffner, S.M.; Eifler, C.W.; Zapata, M.
Source: *American Journal of Epidemiology.* 127(1):135-144, 1988.

Abstract: Using data from the Texas Kidney Health Program and the 1980 census for the state of Texas, researchers calculated age-adjusted incidence of treatment of end-stage renal disease in Mexican Americans, non-Hispanic whites, and African Americans for the years 1978-1984 to compare its incidence rates with those of diabetes mellitus. Researchers computed incidence of treatment of end-stage renal disease per 100,000 population in Texas. The method of Kahn was used for testing the statistical significance between age-adjusted rates to produce summary z statistics for race/ethnic group rate comparisons. Results showed that during the years 1978-1984, there were a total of 2,664 persons with end-stage renal disease among Mexican Americans, 4,322 among non-Hispanic whites, and 2,705 among African Americans enrolled in the Texas Kidney Health Program. Mexican Americans had 2.40-3.21 times higher incidence rates than did non-Hispanic whites, while African Americans had 3.61-4.65 times higher rates than did non-Hispanic whites. While African Americans had a higher incidence rate for end-stage renal disease than did Mexican Americans, Mexican Americans had a 4.48-6.64-fold excess of diabetes-related end-stage renal disease over non-Hispanic whites and a 1.2-1.8-fold excess over African Americans. However, diabetes-related end-stage renal disease explained only 50-60 percent of the excess for Mexican Americans over non-Hispanic whites in end-stage renal disease for all etiologies combined. 5 tables, 28 references.

138

Incidence of Treatment for End-Stage Renal Disease Attributed to Diabetes Mellitus, by Race/Ethnicity: Colorado, 1982-1989.

Form: Journal article.
Corporate Author: US Department of Health and Human Services, Public Health Service, Centers for Disease Control.
Source: *Morbidity and Mortality Weekly Report (MMWR).* 41(44):845-848, November 6, 1992.

Abstract: To describe end-state renal disease diabetes mellitus (ESRD-DM) treatment by race/ethnicity in Colorado and to improve program planning for intervention services, researchers investigated differences in the rates of ESRD-DM treatment for non-Hispanic whites, Hispanics, and African Americans with diabetes in Colorado. The research was conducted as part of the Colorado Diabetes Surveillance Project of the Colorado Department of Health. Data on the treatment of persons with diabetes-related ESRD were obtained from the Intermountain End-Stage Renal Disease Network, which collects demographic, etiologic, and other information for all patients undergoing renal replacement therapy in Colorado and five other states. Researchers defined incident cases as Colorado residents with diabetes who had a primary diagnosis of diabetic nephropathy and for whom renal replacement therapy was initiated during 1982 to 1989. ESRD-DM treatment rates were age-adjusted into four age groups: 0 to 44 years, 45 to 64 years, 65 to 74 years, and over 74 years. From 1982 through 1989, of the 874 Colorado residents beginning ESRD-DM treatment, 64 percent were non-Hispanic white, 22 percent were Hispanic, 9 percent were African American, and 5 percent were persons of other racial backgrounds. In comparison, of the estimated Colorado population with diabetes, 78 percent were non-Hispanic white, 17 percent were Hispanic, 4 percent were African American, and 1 percent were persons of other racial backgrounds. During the study period, the age-adjusted incidence rate for ESRD-DM treatment more than tripled, with the greatest increase occurring among Hispanics (770 percent). Increases among other groups were 440 percent for African Americans and 190 percent for non-Hispanic whites. While the incidence of treated ESRD-DM among non-Hispanic whites was higher for males than females, it was greater for females than males among Hispanics and African Americans. For non-Hispanic whites, the rate for treated ESRD-DM was highest among those age 0 to 44 years; however, for Hispanics, the rate was highest for those over age 74 years.

139

Proteinuria in Mexican Americans and Non-Hispanic Whites With NIDDM.

Form: Journal article.
Author: Haffner, S.M.; Mitchell, B.D.; Pugh, J.A.; Stern, M.P.; Kozlowski, M.K.; Hazuda, H.P.; Patterson, J.K.; Klein, R.
Source: *Diabetes Care.* 12(8):530-536, September 1989.

Abstract: Researchers examined whether Mexican Americans with diabetes mellitus had a higher prevalence of both clinical proteinuria and microalbuminuria than either of two control groups with diabetes (non-Hispanic whites in San Antonio and Wisconsin). Data came from the San Antonio (Texas) Heart Study, a population-based study of diabetes and cardiovascular risk factors in Mexican Americans and non-Hispanic whites that was conducted in two phases. In both phases, each participant underwent a glucose tolerance test in the morning using a 75-gram glucose equivalent load, and diabetes was diagnosed according to the criteria of the National Diabetes Data Group. Using this criteria, researchers determined that there were a total of 192 participants in phase one and 271 participants in phase two with a diagnosis of noninsulin dependent diabetes mellitus (NIDDM). Participants with diabetes from both phases were asked to take part in a diabetes complications examination (retinopathy, proteinuria, peripheral vascular disease, and functional status assessment) beginning in 1984; 317 Mexican Americans and 69 non-Hispanic whites took part. A second population (which formed the basis of the control group in this study) came from the Wisconsin Epidemiologic Survey of Diabetic Retinopathy (WESDR), a population of non-Hispanic whites diagnosed with diabetes after age 30 years. Researchers assessed levels of proteinuria and microalbuminuria in both populations using an early-morning spot urine sample. Participants with albuminuria levels greater than 30 mg/L were considered to have microalbuminuria. Analysis of variance and chi-square tests were used to identify possible ethnic differences in the distribution of variables. Results showed that the Mexican-American participants with diabetes were significantly younger, had higher fasting 2-hour plasma glucose concentrations, a lower prevalence of hypertension, and smoked fewer cigarettes per day than non-Hispanic whites with diabetes. Clinical proteinuria was 2.82 times more prevalent in Mexican American participants compared with non-Hispanic white participants after adjusting for age and duration. The prevalence of microalbuminuria was also significantly higher in Mexican American participants with diabetes than in non-Hispanic white participants with diabetes. There were no significant ethnic differences in sex, duration of diabetes, percent insulin users, or percent current smokers. Researchers also compared 243 previously diagnosed Mexican American participants with diabetes in San Antonio with 476 previously diagnosed participants with diabetes in Wisconsin. Results indicate that previously diagnosed Mexican American participants were younger, had lower systolic blood pressure and lower prevalence to hypertension, were more likely to smoke, and were less likely to be on insulin therapy than the Wisconsin participants with diabetes. After controlling for age and duration of diabetes, the Mexican American participants with diabetes had a significantly higher prevalence of clinical proteinuria than the Wisconsin participants with diabetes. Overall data indicate that Mexican American participants with diabetes have a higher prevalence of clinical proteinuria and microalbuminuria than non-Hispanic white participants with diabetes. 3 tables, 36 references.

140

Risk Factors for End-Stage Renal Disease Among Minorities.

Form: Journal article.
Author: Ferguson, R.; Morrissey, E.
Source: *Transplantation Proceedings.* 25(4):2415-2420, August 1993.

Abstract: Researchers review the epidemiology of end-stage renal disease (ESRD) with special reference to risk factors in minority groups. Several regional studies have reported a greater incidence of ESRD among African Americans relative to whites. One study found incidence rates of 202 per million African-American males and 177 per million African-American females. The comparable figures for white males and females were 56 and 32 per million, respectively. Incidence data collected by the ESRD Network has consistently demonstrated a three- to tenfold increase in the relative risk of ESRD among African Americans, with the greatest risk being seen among African-American females. Among Hispanics, there is also an increased risk of ESRD. A study of the south-central area of Los Angeles, California found the crude cumulative incidence rate of ESRD among Hispanics to be 493 per million. Another study computed age-adjusted 3-year moving average annual incidence among Mexican Americans for the period 1978-1984 and found relatively stable rates of ESRD, ranging from 164 to 208 per million. Data on primary etiologies related to ESRD have shown that, among the three most populous racial/ethnic groups, diabetes mellitus and hypertensive nephrosclerosis were most commonly diagnosed as primary etiologies. Several investigators have pointed to the increased risk posed by hypertension and have identified it as the underlying reason for the increasing rate of ESRD among African Americans. In addition, African Americans, Hispanic Americans, and Native Americans all appear to be more predisposed to ESRD resulting from insulin dependent diabetes mellitus than whites. Numerous explanations have been advanced for the role of diabetes in the development of ESRD. There is evidence to suggest that etiologic factors in the pathogenesis may include glycemic control, intraglomerular pressure, protein load, and systemic pressure. 2 figures, 1 table, 54 references.

141

Survival of Cadaveric Renal Allografts in Hispanic as Compared With Caucasian Recipients.

Form: Journal article.
Author: Saunders, P.H.; Banowsky, L.H.; Reichert, D.F.
Source: *Transplantation.* 37(4):359-362, April 1984.

Abstract: Researchers evaluated allograft survival rates in Hispanic as compared with white non-Hispanic recipients of primary cadaveric renal transplants. They assessed several variables related to ethnically different allograft survival rates including recipient survival, pretransplant serological reactivity, pregraft transfusions, splenectomy, age, donor ethnic origin, and donor-recipient human leukocyte antigen (HLA)-A, B, and DR matches. Data came from a group of 104 consecutive Hispanic or white non-Hispanic recipients of primary cadaveric renal transplants and 82 consecutive Hispanic or white non-Hispanic recipients of primary living related renal transplants. All transplants were performed at Medical Center Hospital in San Antonio, Texas, between 1977 and 1983. Following the procedure, nine patients received antithymocyte globulin as the primary treatment for acute rejection. The remaining patients had acute rejection reactions treated by increasing oral prednisone dose. Patients with juvenile-onset diabetes mellitus had rejection reactions treated with intravenous methylprednisolone. Researchers evaluated allograft survival distributions according to the product-limit method, and evaluated differences between groups using the Mantel-Cox log-rank test. Results showed that Hispanic recipients (118 persons) had a graft survival rate that was significantly better than white non-Hispanics (68 persons) at 6 months (69.6 versus 43.8 percent), as well as at 12 months (66.2 versus 32.1 percent), 24 months (62.2 versus 22.9 percent), and 36 months (59.1 versus 22.9 percent). The patient survival rates of white non-Hispanic and Hispanic recipients of first-cadaveric allografts were respectively 100 percent versus 95.3 percent at 3 months, 97.0 percent versus 95.3 percent at 6 months, 97.0 percent versus 88.5 percent at 12 months, and 93.2 percent versus 88.5 percent at 24 months. Pooled Hispanic and white non-Hispanic primary cadaveric renal allograft recipients survival was 91.5 percent at 1 year, 90.2 percent at 2 years, and 85.6 percent at 3 years. Cadaveric donor origin did not significantly alter graft survival rates in either recipient ethnic group. In contrast to the superior cadaveric renal allograft survival in Hispanic recipients, 1-haplotype-matched or

2-haplotyped-matched living-related renal allografts had comparable graft survival rates in white non-Hispanic and Hispanic recipients. 4 figures, 1 table, 21 references.

See also 011, 040

Defining the Burden: Sizing the Problem of Diabetes Among Hispanics/Latinos

Diabetes complications

Neuropathy and foot problems

142

Risk Factors for Distal Symmetric Neuropathy in NIDDM: The San Luis Valley Diabetes Study.

Form: Journal article.
Author: Franklin, G.M.; Shetterly, S.M.; Cohen, J.A.; Baxter, J.; Hamman, R.F.
Source: *Diabetes Care.* 17(10):1172-1177, October 1994.

Abstract: Researchers investigated the risk factors for distal symmetric (sensory) neuropathy among prevalent cases of noninsulin dependent diabetes mellitus (NIDDM) in southern Colorado. Data came from the San Luis Valley Diabetes Study, a population based study of Hispanic and non-Hispanic white individuals with NIDDM in the Alamosa and Conejos counties of Colorado during 1984-1986. Of 277 people diagnosed with NIDDM (according to the World Health Organization diabetes criteria), researchers classified 77 with neuropathy. The criteria for neuropathy included (1) pain, burning or tingling in both feet; (2) decreased or absent ankle reflexes; and (3) decreased or absent response to an iced tuning fork in the dorsum of the foot. Age, sex, ethnicity, duration of diabetes, insulin use, cigarette use, prior alcohol use, height, and blood pressure were determined as part of a 4-hour interview and examination. Glycated hemoglobin, a marker for glucose control over the previous 60-90 days, was measured by a commercial microcolumn method. Presence of retinopathy was measured by examination of fundus photographs. Presence of nephropathy was determined from urinary microalbumin determination by radioimmunoassay. Presence of peripheral vascular disease was determined by Doppler ultrasound using ankle/arm systolic blood pressure ratios. Serum lipids and fasting C-peptide were measured. Researchers calculated univariate differences for all exposure variables using student t-tests and chi-square tests. Results showed that older age, longer duration of diabetes, increased glycohemoglobin, insulin use, presence of retinopathy or nephropathy, and decreased fasting C-peptide levels were all associated with neuropathy. Male sex, Hispanic ethnicity, blood pressure, height, presence of peripheral vascular disease, cigarette use, prior alcohol use, and serum lipids had no univariate association with neuropathy. Worse glycemic control and insulin use were independently associated with neuropathy in people with NIDDM. 3 tables, 41 references.

See also 011, 081

Defining the Burden: Sizing the Problem of Diabetes Among Hispanics/Latinos

Diabetes complications

Peripheral vascular disease/foot problems

See 040

Diabetes complications

Pregnancy-related

143

Detection and Management of Gestational Diabetes in an Out-of-Hospital Birth Center.

Form: Journal article.
Author: O'Brien, M.E.; Gilson, G.
Source: *Journal of Nurse-Midwifery.* 32(2):79-84, March-April 1987.

Abstract: Researchers describe a program established to screen, diagnose, and manage persons with diabetes within an out-of-hospital birth center in one of the poorest counties in the United States. The incidence of gestational diabetes mellitus (GDM) reported in the birth center, which serves 95 percent Hispanic women, was 10 percent during 1984-1985. Part of the Brownsville (Texas) Community Health Center, which is funded by government grants to provide health care for low-income families, the Maternity Center is an out-of-hospital facility staffed by Certified Nurse Midwives (CNM's). The number of full-time CNM's has fluctuated between 2-5 since the center opened in 1981; each CNM has a caseload of 12-15 clients per month. The method of screening for GDM is a 1-hour glucose test after drinking 50 grams of glucola in a fasting state. CNM's use a glucometer to test capillary blood (finger stick). Clients with glucose values above 134 are rescheduled for a 3-hour glucose tolerance test after 3 days of a high carbohydrate diet; the test involves drinking 100 grams of glucola and finger sticks using a glucometer. Clients diagnosed with GDM receive an appointment with the clinic nutritionist to begin learning about the American Diabetic Association (ADA) diet. All women are immediately placed on a 2,000 calorie diet regardless of their weight (teenagers are allowed approximately 200 more calories depending on their weight gain and activity level). Diagnosed clients also begin classes to learn about the disease, its effects on the baby, and the importance of diet and exercise for glucose control. The clients attend the classes at least every 2 weeks to discuss a 24-hour dietary recall and the results of fasting blood sugar and 2-hour postprandial glucose tests. During the classes, problems with dietary compliance or weight gain are identified. The classes become support groups for the women, who have difficulty with the low carbohydrate nature of the diet because the diet they are used to contains sweet bread, tortillas, rice, tamales, pastas, and a large amount of oil and lard for cooking. GDM clients remain a part of the Maternity Center caseload as long as they are compliant with their diet, keep their appointments for classes and prenatal examinations, and their blood glucose remains under control; if the client's fasting blood sugar and 2-hour postprandial glucose test values are consistently abnormal, the client is transferred to medical management at the Brownsville Community Health Center. All GDM clients who remain at the Maternity Center are comanaged with the community health center OB/GYN physician who reviews each chart as any problems arise. 8 tables, 18 references.

See also 082

Defining the Burden: Sizing the Problem of Diabetes Among Hispanics/Latinos

Diabetes complications

Retinopathy

144

Delayed Diagnosis of Diabetic Retinopathy in Black and Hispanic Patients With Diabetes Mellitus.

Form: Journal article.
Author: Appiah, A.P.; Ganthier, R.; Watkins, N.
Source: *Annals of Ophthalmology.* 23(4):156-158, April 1991.

Abstract: Researchers examined 51 African-American and 35 Hispanic consecutive patients with noninsulin dependent diabetes mellitus (NIDDM) from similar socioeconomic backgrounds who were evaluated initially for diabetic retinopathy. The study analyzed all newly diagnosed diabetic retinopathy cases between October 1988 and July 1989 for eligibility. Patients were seen at the King/Drew Medical Center, Ophthalmology Clinic in Los Angeles, California. Mean ages of participants were 58 years for Hispanics and 53 years for African Americans. A total of 65 percent of the Hispanics were women, as were 68.6 percent of the African Americans. The study excluded all patients who had prediagnosed diabetic retinopathy or those who already had received any form of treatment for diabetic retinopathy. It also excluded all patients with insulin dependent diabetic retinopathy. The diagnosis of NIDDM was based on the criteria of the National Diabetes Data Group. Using the Goldmann three-mirror contact lens biomicroscope and fluorescein angiography, researchers determined the stage of retinopathy the patient had at presentation: (1) Background, (2) preproliferative, or (3) proliferative diabetic retinopathy. Proliferative diabetic retinopathy was diagnosed if there were areas of neovascularization elsewhere and/or on the disc or if there were vitreous hemorrhages. The mean duration between the diagnosis of the diabetes mellitus and the initial diagnosis of the retinopathy was 11.5 years for Hispanics and 12.2 years for African Americans. The percentage of patients with severe diabetic retinopathy at the time of initial diagnosis was 42.9 percent for Hispanics and 37.3 percent for African Americans. 2 tables, 14 references.

145

Diabetic Retinopathy in Mexican Americans and Non-Hispanic Whites.

Form: Journal article.
Author: Haffner, S.M.; Fong, D.; Stern, M.P.; Pugh, J.A.; Hazuda, H.P.; Patterson, J.K.; Van Heuven, W.; Klein, R.
Source: *Diabetes.* 37(7):878-884, July 1988.

Abstract: Because Mexican Americans with diabetes have greater incidence of hyperglycemia and an earlier age of onset than non-Hispanic whites with diabetes, researchers examined whether Mexican Americans with diabetes might also have more severe diabetic retinopathy. Researchers took persons from the San Antonio Heart Study, using 257 Mexican Americans and 56 non-Hispanic whites with noninsulin dependent diabetes mellitus (NIDDM). Diabetes was diagnosed according to the criteria of the National Diabetes Data Group (NDDG). Beginning in 1984, researchers recontacted persons with diabetes from the San Antonio Heart Study and asked them to participate in an examination of diabetes complications. Because relatively few non-Hispanic whites with diabetes were available from the San Antonio Heart Study, researchers also compared the prevalence of diabetic retinopathy in Mexican Americans to that of 896 whites from Wisconsin. The Wisconsin group were participants in a population-based study of retinopathy among previously diagnosed persons with diabetes. A retinal specialist performed ophthalmoscopic examination of the retina, using both direct and indirect ophthalmoscopy after dilation of the pupil. Similar methods of obtaining and evaluating retinal photographs were used in both studies; i.e., certified photographers took stereoscopic retinal photographs of the seven standard fields of each eye. Socioeconomic status was assessed with the Duncan Socioeconomic Status Index, age-adjusted means were calculated by two-way analysis of covariance, and summary odds ratios (OR's), controlling for duration of diabetes, were calculated by the Mantel-Haenszel technique. The BMDP-PLR program was used to perform multiple logistic regression. Results showed that the risk of severe retinopathy (proliferative or preproliferative) relative to background or no retinopathy was significantly greater in Mexican Americans than in non-Hispanic whites (OR equal to 2.37; 95 percent confidence interval (CI): 1.04, 5.39). After researchers controlled for duration of disease, severity of hyperglycemia, age, and systolic blood pressure, Mexican Americans still had an increased risk of severe retinopathy relative to non-Hispanic whites. Previously diagnosed Mexican Americans with diabetes also had an increased prevalence of any retinopathy (OR equal to 2.39; 95 percent CI: 1.63, 3.50) and severe retinopathy (OR equal to 3.21; 95 percent CI: 2.24, 4.59) relative to previously diagnosed whites with diabetes from Wisconsin. 5 tables, 36 references.

146

Factors Associated With Retinal-Vein Occlusion in Hispanics.

Form: Journal article.
Author: Appiah, A.P.; Greenidge, K.C.
Source: *Annals of Ophthalmology.* 19(8):307-309, 312, August 1987.

Abstract: Researchers at the New York Eye and Ear Infirmary evaluated for systemic disease 68 foreign-born Hispanic patients with angiography-proven retinal-vein occlusion (RVO) and 50 foreign-born Hispanic controls who were matched for age and sex. Of the patients, 30 had central retinal-vein occlusion, and 38 had branch retinal-vein occlusion. A retrospective chart review included all patients presenting at the retina clinic between March and June of 1983. All patients underwent a complete eye examination, including slit-lamp biomicroscopy, applanation tonometry, gonioscopy, and funduscopy. All RVO patients also underwent fluorescein angiography. Researchers obtained a complete medical history from each participant with emphasis on history of hypertension, diabetes mellitus, atherosclerosis, and the use of medication, including estrogen preparations. Laboratory testing on all participants included (1) complete blood counts, (2) erythrocyte sedimentation rate, (3) serum analysis, (4) quantitative immunoglobulins, and (5) fasting cholesterol and triglyceride levels. Patients without a history of diabetes mellitus were given a 4-hour glucose tolerance test. Hypertension, the most commonly associated factor, was present in 66.2 percent of the RVO patients in contrast to 18 percent of the controls. Other factors that were more common in the RVO population included open-angle glaucoma, diabetes mellitus, and atherosclerotic heart disease. These, however, were not statistically significant. 3 tables, 15 references.

147

Microvascular Complications of NIDDM in Hispanics and Non-Hispanic Whites: San Luis Valley Diabetes Study.

Form: Journal article.
Author: Hamman, R.F.; Franklin, G.A.; Mayer, E.J.; Marshall, S.M.; Marshall, J.A.; Baxter, J.; Kahn, L.B.
Source: *Diabetes Care.*
14(7, Supplement 3):655-664, July 1991.

Abstract: Researchers examined the differences in the rates of microvascular complications of noninsulin dependent diabetes mellitus (NIDDM) among Hispanic and non-Hispanic white persons in a geographically based case-control study where prevalent cases of NIDDM were identified in medical records. They used data from the baseline visit in the San Luis (Colorado) Valley Diabetes Study, which took participants from two southern Colorado counties. The present study consisted of 279 NIDDM participants aged 20-74 years who were confirmed as having NIDDM by an oral glucose tolerance test and World Health Organization (WHO) criteria. There were 187 Hispanic and 92 non-Hispanic white participants. They attended a 4-hour clinic after an overnight fast to confirm NIDDM diagnosis and assess complication end points. At the start of each visit, participants were examined, interviewed, and blood was drawn for various studies while fasting and at 1 and 2 hours after a 75 gram oral glucose load. Variables used for the study included (1) oral glucose tolerance test, (2) diabetes mellitus, (3) type of diabetes, (4) duration of diabetes, (5) glycohemoglobin, (6) ethnic identification, (7) hypertension, (8) retinopathy, (9) neuropathy, and (10) nephropathy. Duration adjustment by ethnicity used the direct method, with the duration distribution of all participants as the standard. Duration-adjusted prevalence of retinopathy was significantly higher among non-Hispanic whites than among Hispanics. This excess occurred only among non-Hispanic whites with background retinopathy but not in those with more severe retinopathy. Hispanics and non-Hispanic whites did not differ significantly for the prevalence of neuropathy or nephropathy by any measure. There were no significant differences in duration of diabetes or mean glycohemoglobin levels between ethnic groups. 2 figures, 7 tables, 56 references.

148

Summary Report of Ad Hoc Working Group on Latino/Hispanic Outreach: Meeting and Recommendations for the National Eye Health Education Program's Latino/Hispanic Communication Plan.

Form: Report.
Corporate Author: US Department of Health and Human Services, Public Health Service, National Institutes of Health, National Eye Institute, National Eye Health Education Program.
Source: Bethesda, MD, US Department of Health and Human Services, Public Health Service, National Institutes of Health, National Eye Institute, National Eye Health Education Program, 12 p., August 1994.
Availability: National Eye Institute, National Eye Health Education Program, 9000 Rockville Pike, Bethesda, MD 20892.

Abstract: The National Eye Health Education Program (NEHEP), coordinated by the National Eye Institute, convened an Ad Hoc Working Group on Latino/Hispanic Outreach for a 1-day session. The group, consisting of Latino specialists with diverse backgrounds in health, communication, and community outreach, provided assistance to the NEHEP in developing appropriate strategies, messages, and materials to reach Latinos with diabetes with information on the early detection and timely treatment of diabetic retinopathy. Program objectives include

(1) to identify and discuss barriers and opportunities to reaching the target audience; (2) to make recommendations for a final communication plan for reaching the target audience, such as objectives, strategies, target audience segments, messages, materials, channels, and intermediaries; and (3) to make recommendations for other activities as appropriate, including additional research. Latinos constitute 9 percent of the U.S. population of which 25 percent live below the poverty level. Diabetes is the sixth leading cause of death for Latinos; Puerto Ricans are at greatest risk followed by Mexican Americans; Cuban Americans have the lowest risk. Latinos' risk of death from diabetes is greater than that of the general U.S. population. The prevalence of diabetes among Latinos increases after age 45. Focus group research has revealed that (1) a lack of knowledge and misinformation about diabetic eye diseases and cultural factors were identified as the main challenges to message acceptance; (2) poverty, lack of health insurance, transportation, and lack of Spanish-speaking Latino ophthalmologists were identified as structural barriers; (3) the term diabetic retinopathy was too difficult and fearsome; (4) messages should stress the increased risk posed to Latinos; and (5) Spanish-speaking television and radio are preferred over print media. The Ad Hoc Working Group recommended that (1) the term Latinos be used rather than Hispanics since most of the target audience preferred this term, (2) the program should focus on both Latinos and health care providers, (3) message content should incorporate some popular expressions, (4) the message or materials should take into account the barriers faced by the Latino audience, (5) the most effective way to promote the NEHEP messages is within the Latino community, and (6) the NEHEP must identify the right partners and develop a strategic marketing and distribution infrastructure. The conclusion of the meeting emphasized a greater need for applied research outside of educational materials development. A summary of recommendations is included in this report.

See also 011, 023, 065, 067, 112

Diabetes complications

Gallbladder disease

149

Clinical Gallbladder Disease in NIDDM Subjects: Relationship to Duration of Diabetes and Severity of Glycemia.

Form: Journal article.
Author: Haffner, S.M.; Diehl, A.K.; Valdez, R.; Mitchell, B.D.; Hazuda, H.P.; Morales, P.; Stern, M.P.
Source: *Diabetes Care.* 16(9):1276-1284, September 1993.

Abstract: Because persons with noninsulin dependent diabetes mellitus (NIDDM) have an increased prevalence of clinical gallbladder disease, researchers examined the relationship between the prevalence of gallbladder disease and severity of glycemia among persons with NIDDM. They also explored whether the diabetes-gallstone association is a causal one. Researchers used data from 462 individuals with diabetes identified during the San Antonio Heart Study, a population-based survey of diabetes and cardiovascular disease among Mexican Americans and non-Hispanic whites. Researchers determined gallbladder disease status during an in-home interview. If the participant responded yes to the question, Have you ever had your gallbladder removed?, researchers considered the disease to be present. Researchers also considered gallbladder disease to be present if the participant acknowledged having had an X-ray or ultrasound of their gallbladder taken and having found stones through this process. Anthropometric measurements included height, weight, subscapular and triceps skin folds, and calculation of body mass index (BMI). Researchers drew blood samples after a 12-hour fast to determine plasma glucose and serum insulin concentrations, then administered a 75-gram glucose equivalent load, and drew blood samples 1 and 2 hours later to determine plasma glucose levels. Diabetes mellitus was diagnosed according to the plasma glucose criteria of the National Diabetes Data Group (NDDG). The overall prevalence of self-reported gallbladder disease was 34.2 percent in women with diabetes and 7.2 percent in men with diabetes. Researchers restricted most of the analyses to women, since the number of cases of gallbladder diseases in men was very low (n equal to 13). Using multiple regression models, researchers examined the effect of diabetes duration, glycemia, and insulin therapy on the prevalence of gallbladder disease. Analyses were performed using the Systat and Logistat statistical software. Though duration of diabetes was significantly positively related to the prevalence of gallbladder disease (p equal to 0.012), and fasting glucose concentration was inversely associated with gallbladder disease (p equal to 0.021), type of therapy was not significantly associated with gallbladder disease. 4 tables, 55 references.

150

Increased Prevalence of Clinical Gallbladder Disease in Subjects With Non-Insulin-Dependent Diabetes Mellitus.

Form: Journal article.
Author: Haffner, S.M.; Diehl, A.K.; Mitchell, B.D.; Stern, M.P.; Hazuda, H.P.
Source: *American Journal of Epidemiology.* 132(2):327-335, August 1990.

Abstract: Researchers investigated the association between noninsulin dependent diabetes mellitus (NIDDM) and the prevalence of gallbladder disease in 1,250 men and 1,656 women from phase II of the San Antonio (Texas) Heart Study, 1984-1986. The San Antonio Heart Study was a population-based study of diabetes, cardiovascular disease, and health status carried out in a biethnic sample of Mexican Americans and whites; 68 percent were Mexican American, a population at high risk for both gallbladder disease and NIDDM. The sample came from (1) a low-income barrio in which traditional Mexican American culture is maintained; (2) a middle-income ethnically balanced neighborhood; and (3) an upper-income, predominately non-Hispanic suburb. A home interview determined gallbladder disease status. The disease was considered to be present if the participant responded yes to the question: Have you ever had your gallbladder removed? Gallbladder disease was also considered to be present if the participant answered first yes and then stones to the questions: (1) Have you ever had an x-ray or ultrasound taken of your gallbladder?; and (2) What did the doctor say the x-ray or ultrasound showed? Diabetes mellitus was diagnosed according to the plasma glucose criteria of the National Diabetes Data Group as modified for epidemiologic studies. Participants who did not meet these criteria, but who were currently being treated with either oral hypoglycemic agents or insulin were considered to have diabetes. Participants not taking insulin were considered to have NIDDM. Participants taking insulin but having a body mass index of greater than 30kg/m squared and an age at diagnosis of over 39 years were also considered to have NIDDM. Participants with insulin dependent diabetes mellitus or with unclassifiable diabetes were excluded from the present analyses. NIDDM was significantly associated with gallbladder disease in Mexican American men and women and in non-Hispanic white women. 1 figure, 6 tables, 34 references.

151

Ultrasound Survey of Gallbladder Disease Among Mexican Americans in Starr County, Texas: Frequencies and Risk Factors.

Form: Journal article.
Author: Hanis, C.L.; Hewett-Emmett, D.; Kubrusly, L.F.; Maklad, M.N.; Douglas, T.C.; Mueller, W.H.; Barton, S.A.; Yoshimaru, H.; Kubrusly, D.B.; Gonzalez, R.; Schull, W.J.
Source: *Ethnicity and Disease.* 3(1):32-43, Winter 1993.

Abstract: In a population-based ultrasound survey, researchers examined the relationships between gallbladder disease (GBD) and obesity, diabetes, and hypertension, and evaluated the association between GBD and distribution of lipids, lipoproteins, and apolipoproteins. GBD was indicated by previous cholecystectomy and/or gallstones on ultrasound. Researchers randomly selected Mexican American participants from three communities in Starr County, Texas (the 1990 U.S. Census data indicated the population as approximately 97 percent Hispanic American). Using personal door-to-door interviews, specific individuals aged 15 to 74 years were invited to participate in a physical examination as part of the study. The physical examination included an electrocardiogram; two blood pressure determinations; anthropometric measurements;

medical, nutrition, smoking, and drinking histories; ultrasound of the gallbladder; and collection of blood for laboratory testing. Laboratory testing included determinations of hemoglobin, glucose, total cholesterol, triglycerides, and apolipoproteins. Researchers classified participants as having gallbladder disease if there was the presence of gallstones on ultrasound; they diagnosed diabetes if individuals had elevated blood glucose levels consistent with the National Diabetes Data Group criteria for diabetes. BMI served as the primary measure of obesity. Standard chi-square statistics and Fisher's Exact Test were used to assess pairwise associations of overt disease categories, logistic regression, and analysis of covariance techniques. A total of 1,004 participants completed physical examinations for a participation rate of 73.2 percent. Participation rates were higher among older individuals. The overall prevalence of GBD was 2.8 times higher in women than in men, with considerable variation by age. Overall, more than 40 percent of the participants had either gallbladder disease, noninsulin dependent diabetes mellitus, obesity, or hypertension. Among participants aged 45 and older, 70 percent had one or more of these chronic conditions. Of the 75 with confirmed cholecystectomies, 73 also reported having had gallstones. Diabetes mellitus prevalence estimates were conservative, with approximately 15 cases of diabetes mellitus diagnosed in the population. Obesity was extremely prevalent in the population, with frequency by age patterns differing in men and women. The frequencies of hypertension were also very high. There was an overall association in women between diabetes and GBD, but diabetes and obesity show the strongest associations with cholecystectomy among women under 45 years of age. Women with diabetes were 6.8 times as likely to have had a cholecystectomy than those without diabetes. Obesity was most strongly associated with gallbladder surgery. For lipid levels and GDM, the only significant differences were those among mean alpha-lipoprotein levels and the ratio of alpha- to beta-lipoproteins in women. 3 tables, 48 references.

See also 095, 104

152

Apolipoprotein A-IV Genetic Polymorphism and Its Impact on Quantitative Traits in Normoglycemic and Non-Insulin-Dependent Diabetic Hispanics From the San Luis Valley, Colorado.

Form: Journal article.
Author: Kamboh, M.I.; Iyengar, S.; Aston, C.E.; Hamman, R.F.; Ferrell, R.E.
Source: *Human Biology*. 64(4):605-616, August 1992.

Abstract: Using isoelectric focusing and immunoblotting, researchers analyzed plasmas from 188 Hispanic Americans with noninsulin dependent diabetes and 238 normoglycemic Hispanic Americans to determine apolipoprotein A-IV (APOA4) genotype frequencies and to estimate the impact of the genotypes on quantitative traits. Researchers estimated the impact of APOA4 polymorphism on eight quantitative traits: Total cholesterol; high density lipoprotein cholesterol (HDL-C) and its subfractions, HDL2 cholesterol (HDL2-C) and HDL3 cholesterol (HDL3-C); low density lipoprotein cholesterol (LDL-C); triglycerides; fasting glucose; and fasting insulin levels. The Hispanic population was part of the San Luis Valley (Colorado) Diabetes Study, which was designed as a geographically based case-control study of noninsulin dependent diabetes mellitus (NIDDM) in Alamosa and Conejos counties of southern Colorado. The 238 persons without diabetes were aged 21-74 years; the 188 persons with diabetes were aged 25-74 years. Males and females were analyzed separately in both groups. Glucose fasting, insulin fasting, total HDL-C, HDL3-C, and body mass index (BMI) measures were significantly different between normoglycemic participants and participants with diabetes in both sexes. Age and total cholesterol levels were different among females in both groups, and LDL-C was different among males in both groups. Total HDL-C and its fractions, HDL2-C and HDL3-C were significantly higher in females than in males in both groups. In normoglycemic participants, triglycerides were higher in males than in females, whereas females with diabetes had higher BMI and total cholesterol than males with diabetes. All individuals fasted for 12 hours before their blood was drawn and analyzed for quantitative traits. APOA4 phenotyping was performed on native plasma collected during the fasting sample of a standard oral glucose tolerance test, using polyacrylamide gels for isoelectric focusing (IEF) followed by immunoblotting, as described by Kamboh and Ferrell (1987). The frequencies of the two common alleles, APOA4 1 and APOA4 2, were 0.929 and 0.069 respectively in normoglycemic participants and 0.901 and 0.096 respectively in participants with diabetes. In contrast to earlier findings that the APOA4 2 allele was significantly associated with elevated levels of insulin in non-Hispanic whites with diabetes and non-Hispanic white LDL-C controls, these findings did not support such effects in Hispanics. However, results did show that the control Hispanic females with the APOA4 1,2 phenotype had significantly lower total HDL-C, HDL2-C and HDL3-C levels than females having the APOA4 1 phenotype. 6 tables, 38 references.

153

Evidence for a Major Gene Affecting Postchallenge Insulin Levels in Mexican-Americans.

Form: Journal article.
Author: Mitchell, B.D.; Kammerer, C.M.; Hixson, J.E.; Atwood, L.D.; Hackleman, S.; Blangero, J.; Haffner, S.M.; Stern, M.P.; MacCluer, J.W.
Source: *Diabetes.* 44(3):284-289, March 1995.

Abstract: To determine whether a major gene affects 2-hour postchallenge insulin levels in Mexican Americans, researchers conducted segregation analyses using data collected on 527 individuals from 27 families in San Antonio, Texas. Families came from the San Antonio Family Heart Study, which was initiated in 1991 to investigate the genetics of heart disease and its determinants among Mexican-Americans. All participants received a medical examination that included the standard 2-hour oral glucose tolerance test. Researchers typed markers for linkage studies at the loci of the (1) intestinal fatty acid-binding protein gene (FABP2) (Homo sapiens albumin (HSA) 4q28), (2) glucokinase gene (GCK) (HSA 7p13), (3) insulin gene (INS) (HSA 11p15), (4) insulin receptor gene (INSR) (HSA 19p13), and (5) low-density lipoprotein receptor gene (LDLR) (HSA 19p13.3-13.2). To determine whether a major gene affected 2-hour insulin levels, regression models were used to conduct complex segregation analyses. Using the best-fitting Mendelian genetic model identified through the segregation analyses, researchers conducted formal linkage analyses to determine whether the major gene for insulin levels was linked to one of the five candidate genes for insulin levels. Results showed that in the 27 participating families, there were a total of 94 individuals with diabetes (14 percent of men and 15 percent of women) and 84 individuals with impaired glucose tolerance (IGT). Diabetes was diagnosed according to the World Health Organization plasma glucose criteria. The criterion for IGT was a 2-hour glucose level between 140 and 200 mg/dL. Segregation analysis results strongly supported the existence of a major gene that influences 2-hour insulin levels. To ensure identification of the Mendelian model with the highest likelihood, researchers evaluated each covariate in the dominant model for significance. The estimated frequency of the high insulin allele was 0.587; 83 percent of the individuals were likely to carry one or two copies of the higher insulin allele. In the linkage analysis, none of the markers showed evidence for linkage heterogeneity among families. Findings indicate that insulinemia is not tightly linked to three loci capable of influencing insulin levels: GCK, INSR, and LDLR. It is likely that this major gene is not linked to the FABP2 gene, which has been previously associated with insulin resistance through sib-pair analysis. There was little evidence either for or against linkage to the insulin allele locus. 1 figure, 5 tables, 35 references.

154

Genetic Studies of Type 2 (Non-Insulin-Dependent) Diabetes Mellitus: Lack of Association With Seven Genetic Markers.

Form: Journal article.
Author: Iyengar, S.; Hamman, R.F.; Marshall, J.A.; Baxter, J.; Majumder, P.P.; Ferrell, R.E.
Source: *Diabetologia.* 32(9):690-693, 1989.

Abstract: Researchers report the results of tests of association between noninsulin dependent diabetes mellitus (NIDDM) and polymorphic markers in the blood: The blood groups ABO, Rhesus (RH), Duffy (FY), and Kell (K and KP); haptoglobin (HP) phenotypes; and a group specific component (i.e., the serum vitamin D binding protein). Study participants came from the San Luis Valley (Colorado) Diabetes Study (SLVDS), a population-based case-control study of risk factors for NIDDM and its complications among non-Hispanic whites and Hispanic Americans in the San Luis Valley. Participants were questioned about their Hispanic ethnicity and their diabetic status was determined using a 75 g oral glucose tolerance test. The total sample included 788 individuals (individuals classified as having insulin dependent diabetes mellitus were excluded). During the study, researchers collected weekly blood samples from participants and conducted typing for the antigens of the blood groups, including ABO, RH, FY, and Kell (K and KP). In each ethnic group the phenotype frequencies among the participants with diabetes were compared to those among the participants without diabetes. Chi-square (G2 statistic) analysis was used to compare associations between NIDDM and the different phenotypes. Results showed that the only statistically significant association occurred between NIDDM and the Kell blood group among non-Hispanic whites. However, allelic tests of association were not significant for the alleles at the Kell locus. No significant associations with NIDDM were observed for the various phenotypes among Hispanics. 2 tables, 20 references.

155

HLA Class II Alleles and Susceptibility and Resistance to Insulin Dependent Diabetes Mellitus in Mexican-American Families.

Form: Journal article.
Author: Erlich, H.A.; Zeidler, A.; Chang, J.; Shaw, S.; Raffel, L.J.; Klitz, W.; Beshkov, Y.; Costin, G.; Pressman, S.; Bugawan, T.; Rotter, J.I.
Source: *Nature Genetics.* 3(4):358-364, April 1993.

Abstract: Researchers examined the role of human leukocyte antigen (HLA) class II alleles in genetic predisposition to insulin dependent diabetes mellitus (IDDM) among Mexican-American families derived from Hispanic whites and Native Americans. HLA class polymerase chain reaction (PCR)/sequence-specific oligonucleotide (SSO) typing was performed on 252 individuals in 41 simplex and 1 multiplex (three affected siblings) IDDM families as well as on 61 unrelated control individuals. One control haplotype data set was derived from the analysis of the unrelated Mexican-American controls; another consisted of haplotypes that were observed in the IDDM families but were not transmitted to IDDM patients. Researchers determined that there was no significant difference between the family-matched and unrelated control haplotypes using the G-test for heterogeneity and both control groups were combined for subsequent analysis. In cases where unusual HLA-DRB1-DQB1 haplotypes were identified, HLA-DQA1 typing was also performed. In this population, the HLA-DRB1*0301-DQA1 *0501-DQB1*0201 haplotype is highly associated with IDDM. Results showed that several haplotypes were significantly decreased among IDDM patients relative to controls. Such negative associations, termed protection or resistance, have been reported for several specific haplotypes, particularly the HLA-DR2 and

HLA-DR5. The predisposing and protective effects of specific HLA-DR-DQ haplotypes can be identified by comparing haplotype frequencies. Of the 16 HLA-DR-DQ DR4 haplotypes identified, only those bearing HLA-DQB1*0302 conferred risk; the HLA-DRB1 allele also markedly influenced IDDM risk. All high risk haplotypes (HLA-DR3 and HLA-DR4) were of European origin while the most strongly protective haplotype (HLA-DRB1*1402) was Native American. In the study population, there was an excess of HLA-DR3/4 heterozygotes among the patients; this genotype confers a greater risk than either HLA-DR3/3 or HLA-DR4/4, implying that the predisposing effects of HLA-DR3 and HLA-DR4 are different and that the two react synergistically. The one multiplex pedigree contained three affected siblings, all of whom were HLA-DRB1*0402/*0402, consistent with the notion that this is a high risk HLA-DR4 haplotype. The general pattern of neutral and protective haplotypes indicates that a presence of Asp-57 in the HLA-DQbeta chain does not confer IDDM protection per se and indicates that both HLA-DRB1 and HLA-DQB1 influence IDDM susceptibility and protection. 1 figure, 3 tables, 50 references.

156

Hep-G2 Glucose Transporter Gene Polymorphism in Caucasian, Black, Hispanic and Japanese Patients With NIDDM.

Form: Journal article.
Author: Murakami, K.; Wilk, J.; Nishida, K.; Sussman, K.E.; Draznin, B.
Source: *Diabetes Research and Clinical Practice.* 9(2):115-121, 1990.

Abstract: Researchers examined the frequencies of BglII and XbaI restriction fragment length polymorphisms (RFLP's) after digestion and hybridization with the glucose transporter probe, hGT2-2, in white, African American, Hispanic, and Japanese persons with noninsulin dependent diabetes mellitus (NIDDM). Data came from an unrelated sample of whites (34 with NIDDM and 16 controls), African Americans (19 with NIDDM and 22 controls), Hispanics (19 with NIDDM and 13 controls), and Japanese (20 with NIDDM and 21 controls). Researchers collected a 10 ml blood sample from each participant and isolated DNA from the white blood cells using the method of Herrmann et al. They isolated the DNA and determined the RFLP's by viewing exposed films of the fragments. Genotypic differences between ethnic groups and between controls and participants with NIDDM were analyzed using chi-square analysis. Analysis of the DNA with the restriction endonuclease BglII and hybridization with a cDNA clone of the Hep-G2 glucose transporter revealed two alleles (I and II). All white participants (persons with NIDDM and controls) were homozygous for allele I. An overwhelming majority of Hispanics and Japanese were also homozygous for allele I, regardless of the presence of NIDDM. The frequency of allele II was much greater in African Americans, but no particular pattern was associated with NIDDM. The digestion of DNA with restriction endonuclease XbaI also revealed the existence of two alleles (I and II). In whites, homozygotes for allele I were found only among NIDDM patients. There were significant differences in the incidence of the RFLP's between whites and African Americans, both in the control group and among persons with NIDDM. Digestion with XbaI revealed a higher incidence of the homozygotic state for allele I in whites with NIDDM than in controls (12 percent versus 0 percent). In African Americans and Hispanics with NIDDM, researchers found a high incidence of a combination of two traits: 42 percent of African Americans with NIDDM and 47 percent of Hispanics with NIDDM were homozygous for the BglII allele I and heterozygous for XbaI. Only 23 percent of African Americans or Hispanics without NIDDM had this combination. There was no association between RFLP frequency and NIDDM among Japanese participants. These data support the influence of race on both BglII and XbaI RFLP's. The homozygotes for XbaI in whites and the presence of two specific traits in African Americans and Hispanics appear with higher frequency in NIDDM. 5 figures, 20 references.

157

Increased Risk for Gestational Diabetes Mellitus Associated With Insulin Receptor and Insulin-Like Growth Factor II Restriction Fragment Length Polymorphisms.

Form: Journal article.
Author: Ober, C.; Xiang, K.S.; Thisted, R.A.; Indovina, K.A.; Wason, C.J.; Dooley, S.
Source: *Genetic Epidemiology.* 6(5):559-569, 1989.

Abstract: Researchers examined restriction-fragment length polymorphisms (RFLP's) near candidate diabetogenic genes as one approach to identifying molecular markers for gestational diabetes mellitus (GDM). Study participants came from patient populations at two hospitals in Chicago, Illinois. Glucose tolerance testing was offered to all women with glucose values of 130 mg/100 ml or greater at 1 hour after a 50 gram glucose load. Diagnosis of GDM was made on the basis of 100 gram oral glucose tolerance testing (OGTT) according to the criteria of O'Sullivan and Mahan (1964). Researchers enrolled in the study all women diagnosed with GDM who were participating in the program of the Northwestern University Diabetes in Pregnancy Center. Controls came from pregnant women at the two hospitals with either (1) glucose values less than 130 mg/100 ml on the routine screen, or (2) all normal values on a 3 hour OGTT. Researchers interviewed all cases and controls, asking them about personal and family history of diabetes mellitus, reproductive history, oral contraceptive use, and cigarette use. They also collected a blood sample from each participant for genetic analysis. Researchers used logistic regression to determine which, if any, epidemiologic factors or genotypes were risk factors for GDM. They divided results by African-American, white, and Hispanic participants. Among African-American participants, results showed that the insulin receptor allele 1 (INSR) genotype, interactions between the INSR allele 1 with body mass index (BMI), and a history of diabetes mellitus in the participant's mother all contributed significantly to GDM risk. Among white participants, a similar relationship between the INSR allele 1 and BMI was observed that contributed to GDM risk as well as an interaction between the INSR genotype and the insulin-like growth factor II (IGF2) allele 2. Among Hispanics, no genetic variables contributed significantly to the risk for GDM. Findings support the hypothesis that GDM is a heterogeneous disorder with respect to phenotypic and genotypic features. Data suggest that risk for GDM in African Americans and whites is not due to obesity per se but to interactions between obesity and INSR alleles. 3 figures, 6 tables, 31 references.

158

Lp(a) Concentrations and Phenotypes in Children With Insulin-dependent Diabetes Mellitus.

Form: Journal article.
Author: Haffner, S.M.; Frangos, M.; Williamson, J.; Santiago, J.; Valdez, R.; Aldrete, G.; Mykkanen, L.; Gruber, K.K.; Rainwater, D.L.
Source: *Chemistry and Physics of Lipids.* 67-68:223-231, 1994.

Abstract: Researchers examined the relationship of Lipoprotein(a) (Lp(a)) concentrations, which are associated with increased coronary heart disease, to the level of glycemic control, Tanner stage, and molecular weight and phenotype of apolipoprotein (apo(a)) in children with insulin dependent diabetes mellitus (IDDM). Investigators compared Lp(a) concentrations in 66 white non-Hispanic children with IDDM and 18 white non-Hispanic normoglycemic age-matched children; no participants had detectable albuminuria and all IDDM participants had to have a documented fasting plasma glucose above 140 mg/dl at diagnosis in addition to a documented episode of diabetic ketoacidosis. Participants were recruited from the Pediatric Endocrinology Clinic at St. Louis (Missouri) Children's Hospital. Lp(a) concentrations in postpubertal children (Tanner stages 4 and 5) with IDDM were compared to non-Hispanic persons without diabetes from the San Antonio (Texas) Heart study. Initially, investigators examined the relationship between pubertal status assessed by Tanner staging and erythrocyte sorbitol levels in male and female participants with IDDM and those without diabetes. Tanner staging was done by a pediatric endocrinologist according to the usual clinical criteria; Tanner stage I was prepubertal and Tanner stage 4 and 5 were postpubertal. Lp(a) was measured using a monoclonal anti-Lp(a) antibody technique with intra- and interassay coefficients of variation of 4 percent and 8 percent, respectively. Lp(a) levels were also measured in 208 non-Hispanic white participants without IDDM in the San Antonio Heart Study. Apo(a) isoform sizes were determined by immunochemical detection of apo(a) among serum proteins resolved by SDS electrophoresis. Statistical analysis was done using the t-test, multiple linear regression, Spearman correlation coefficients, Mann Whitney, and chi-squared tests. Lp(a) concentrations (mg/dl) were lower, but not statistically significantly lower, in participants with IDDM than in participants without IDDM (12.0 with a standard deviation of 2.2 versus 20.0 with a standard deviation of 6.1, respectively). Postpubertal participants, particularly males, had increased Lp(a) concentrations relative to prepubertal participants. Higher apo(a) molecular weight was associated with decreased Lp(a) concentrations among participants with IDDM and participants without IDDM; apo(a) size was not different among all participants. The molecular weight of apo(a) did not differ by Tanner stage. Lp(a) concentrations were not significantly correlated with glycosylated hemoglobin levels or duration of diabetes in participants with IDDM. Among IDDM participants only, Tanner stage was significantly positively associated to Lp(a) concentrations, and molecular weight was significantly negatively related to Lp(a) concentrations. Postpubertal IDDM subjects had Lp(a) concentrations similar to the adult non-Hispanic white participants without diabetes from the San Antonio Heart Study. Researchers found that prepubertal and postpubertal participants with IDDM did not have increased Lp(a) concentrations relative to a small group of age-matched normoglycemic controls or a larger group of adults. The trend towards higher Lp(a) levels in postpubertal males may suggest an effect of hormones on modulating Lp(a) concentrations. 3 tables, 35 references.

159

Type II Diabetes Mellitus and Polymorphism of Insulin-Receptor Gene in Mexican Americans.

Form: Journal article.
Author: Raboudi, S.H.; Mitchell, B.D.; Stern, M.P.; Eifler, C.W.; Haffner, S.M.; Hazuda, H.P.; Frazier, M.L.
Source: *Diabetes.* 38(8):975-980, August 1989.

Abstract: Researchers examined the association between type II (noninsulin dependent diabetes, NIDDM) and restriction-fragment-length polymorphisms (RFLP's) of the insulin-receptor gene in Mexican Americans, a high-risk population for diabetes. The study included 242 Mexican Americans and non-Hispanic whites with type II diabetes and 202 age-, sex-, and ethnicity-matched control participants from the San Antonio Heart Study, a population-based study of cardiovascular disease and diabetes in Mexican Americans and non-Hispanic whites. Diabetes was diagnosed according to the National Diabetes Data Group (NDDG) criteria. Researchers obtained whole blood specimens in heparinized containers and kept them frozen in sterile polypropylene tubes until they were analyzed. Body mass index (BMI) was used as an indicator of overall adiposity, and the ratio of the subscapular to the triceps skin fold was used as an index of body fat distribution. Differences in age, anthropometric indexes, and age at diagnosis were evaluated according to genotype by analysis of variance. The odds ratio for diabetes was computed according to genotype and adjusted for age by the Mantel-Haenszel procedure, then evaluated for statistical significance with the Mantel-Haenszel chi-square statistic. The 95 percent confidence interval of the odds ratio was computed by the method of Robins et al. Researchers identified alleles of 6.7 kilobases (A allele), 6.2 kilobases (B allele), and 3.4 kilobases (C allele). The C allele was observed in Mexican Americans only, where its frequency among control participants without diabetes was 17.7 percent. Mexican Americans with diabetes were twice as likely as control participants to be homozygous for the C allele. The Mantel-Haenszel odds ratio, adjusting for age, indicated a 4.71-fold increased risk of diabetes among Mexican Americans with the CC genotype compared with Mexican Americans without this genotype. Findings suggest that the C allele appears to be associated with type II diabetes in Mexican Americans. 1 figure, 3 tables, 48 references.

Diabetes Clinical Control

Diagnosis/screening

160

Accuracy of Reported Family History of Diabetes Mellitus: Results From San Luis Valley Diabetes Study.

Form: Journal article.
Author: Kahn, L.B.; Marshall, J.A.; Baxter, J.; Shetterly, S.M.; Hamman, R.F.
Source: *Diabetes Care.* 13(7):796-798, July 1990.

Abstract: Researchers conducted a study on a subsample of families of participants in the San Luis Valley Diabetes Study to examine two possible sources of bias in the assessment of family history of diabetes: (1) A person with diabetes may be more likely to report a relative with diabetes than a normoglycemic person would be, and (2) relatives of individuals with diabetes may be more likely to be tested for diabetes than relatives of individuals without diabetes. Researchers selected a sample of 20 study participants who had a baseline clinic visit in April 1984-1987. They selected participants (probands) sequentially until they identified 5 non-Hispanic white and 5 Hispanic persons with glucose tolerance tests according to World Health Organization (WHO) diabetes criteria and 5 white and 5 Hispanic persons with normal glucose tolerance tests at the baseline clinic visit. Researchers chose at least two of each group of five who reported a positive family history of diabetes mellitus at the baseline clinic visit. All 20 probands provided contact information on their 227 primary family members; 145 (64 percent) were alive and could be located. Researchers based results on 195 family members, since only incomplete data could be obtained on the remainder. Positive family history was defined as at least one member of the primary family other than the proband with diabetes, including parents, siblings, and children of the proband. Interviewers telephoned family members to ask if they had ever been tested for diabetes, when they had been most recently tested, why they had been tested, and if they had ever been told they had diabetes. Study participants accurately reported family history of diabetes, since no discrepancies existed between proband and family reports. A positive family history of diabetes was associated with increased reported screening among Hispanics, but not among whites. Overall, only a moderate percentage (48.4 percent) of family members reported ever having received testing for diabetes. Women were more likely to report being screened than men, regardless of whether they had a positive family history of diabetes. Data suggest that, although persons with diabetes and control participants accurately reported their family history of known diabetes, indications of differential screening may alter the amount of known and subsequently reported diabetes in families. 2 tables, 6 references.

161

Diabetes and Disability Among Mexican Americans: The Effect of Different Measures of Diabetes on Its Association With Disability.

Form: Journal article.
Author: Macheledt, J.E.; Vernon, S.W.
Source: *Journal of Clinical Epidemiology.* 45(5):519-528, May 1992.

Abstract: Researchers used data from the Hispanic Health and Nutrition Examination Survey (HHANES) to evaluate the association between noninsulin dependent diabetes mellitus (NIDDM) and disability, as defined by self-report and by an oral glucose tolerance test (OGTT). Bilingual and bicultural researchers conducted interviews in the homes of eligible participants. They asked questions on self-reported health status, physician-diagnosed medical conditions, health service utilization, and other factors. At a later date, a physician conducted a physical examination at a mobile examination center. Researchers alternately assigned persons aged 20-74 years to a one-half subsample who underwent an OGTT administered according to the guidelines of the National Diabetes Data Group (NDDG). The procedure consisted of an overnight fast, a fasting blood sample followed by an oral beverage containing 75 grams of glucose, and additional blood samples at 1 and 2 hours. One thousand and twelve participants completed the OGTT. The World Health Organization (WHO) criteria were used to define NIDDM. Researchers considered any person who reported that a physician had told them they had diabetes or sugar diabetes as having self-reported diabetes. Researchers defined a person as having a disability if he or she answered yes to one or more of a series of questions regarding limitation in major activity such as job performance, the ability to perform housework, or the activities of daily living, due to chronic illness or impairment. Researchers estimated prevalence rates directly from the weighted data and considered them representative of Mexican Americans in the southwestern United States. Among the total sample of persons who completed a clinical examination, 14.6 percent reported a limitation of job performance, the inability to complete housework, or the inability to perform activities of daily living. Among the subsample who completed the clinical examination and reported having diabetes, 31.6 percent claimed similar disability. Among respondents who also completed an OGTT or who were currently receiving insulin, 25 percent of persons with abnormal glucose levels and 40.2 percent of those who were receiving insulin reported a disability, compared to 14.9 percent in those with normal glucose levels. Self-reported diabetes was positively associated with functional impairment in the population after adjusting for demographic variables and comorbidity. However, after adjusting for other factors, diabetes confirmed by an OGTT was not significantly associated with disability. Two appendixes include the criteria for deciding that a person has a disability and the use of sample weights and the design effect in the data analysis for HHANES. 2 figures, 5 tables, 31 references.

162

Evaluation of Three Potential Screening Tests for Diabetes Mellitus in a Biethnic Population.

Form: Journal article.
Author: Haffner, S.M.; Rosenthal, M.; Hazuda, H.P.; Stern, M.P.; Franco, L.J.
Source: *Diabetes Care.* 7(4):347-353, July-August 1984.

Abstract: Researchers tested the ability of three potential screening tests for diabetes to detect noninsulin dependent diabetes mellitus (NIDDM) in 130 Mexican Americans with diabetes and 50 whites with diabetes who were part of the San Antonio Heart Study, using the National Diabetes Data Group (NDGG) criteria as the standard. Researchers performed a single glucose tolerance test on each participant. Participants fasted for 12-14 hours before the drawing of a fasting blood specimen, and additional specimens were taken at 1 and 2 hours postglucose load. Plasma glucose concentrations were measured using an Abbot Bichromatic Analyzer. Researchers evaluated the sensitivity, specificity, and predictive value of these three potential screening tests: (1) Fasting plasma glucose (FPG), using the NDDG cutpoint of 140 mg/dl; (2) 1-hour postload plasma glucose, using the NDDG cutpoint of 200 mg/dl; and (3) 2-hour postload plasma glucose, also using the NDDG cutpoint of 200mg/dl. Researchers measured height, weight, body mass index (BMI), and skin folds. They determined ethnic classification using an algorithm that included Spanish and non-Spanish surname of parents, birthplace of parents, ethnic self-identity, and stated ethnicity of all four grandparents. The sensitivity of the fasting plasma glucose cutpoint in detecting diabetes was low in both whites (36 percent) and Mexican Americans (59.3 percent), and was related to the age-adjusted prevalence rates of diabetes in the two ethnic groups (whites, 4.9 percent; Mexican Americans, 10.9 percent). The 2-hour postglucose load cutpoint had good sensitivity (more than 93 percent) and specificity (more than 99 percent) in both ethnic groups. The ethnic difference in the sensitivity of the fasting plasma glucose cutpoint appeared to be related to the greater hyperglycemia of Mexican Americans with diabetes compared with that of whites with diabetes. Nearly 30 percent of Mexican Americans with diabetes had fasting plasma glucose values greater than or equal to 200 mg/dl compared with only 10 percent of whites with diabetes. The difference in severity of hyperglycemia between the ethnic groups appears to be unrelated to ethnic differences in adiposity, pharmacologic treatment, or delay in diagnosis, although longer disease duration in Mexican Americans may explain part of the difference. 5 tables, 22 references.

163

Evidence of Bimodality of Two Hour Plasma Glucose Concentrations in Mexican Americans: Results From the San Antonio Heart Study.

Form: Journal article.
Author: Rosenthal, M.; McMahan, C.A.; Stern, M.P.; Eifler, C.W.; Haffner, S.M.; Hazuda, H.P.; Franco, L.J.
Source: *Journal of Chronic Diseases.* 38(1):5-16, 1985.

Abstract: Researchers examined evidence for bimodality in the distribution of 2-hour post-oral glucose challenge plasma glucose concentrations of Mexican Americans. Researchers derived data from a population-based sample of Mexican Americans who were part of the San Antonio Heart Study. Researchers selected 821 participants who lived in barrio and middle-class neighborhoods, because these two neighborhoods had a higher prevalence of diabetes. Participants fasted for 12 hours prior to a clinic visit. Researchers drew a fasting blood sample, after which they administered a 75-gram glucose-equivalent carbohydrate load. Blood samples were drawn 1 and 2 hours post challenge. Researchers measured plasma glucose concentrations by the glucose oxidase method using an Abbott Bichromatic Analyzer. They took three steps in model selection: (1) Fitting specific models and estimating parameters, (2) determining which of the models were preferred, and (3) evaluating the goodness of fit of the preferred model to the data. Plasma glucose concentrations were transformed using natural logarithms. This transformation removed some of the positive skewness observed in the distribution of plasma glucose concentrations to permit adequate fitting of the data with a single normal distribution. By fitting both a single normal distribution model and a mixture model of two normal distributions for each age decade (25-34, 35-44, 45-64, and 55-64), researchers found that the mixture model was preferred to the single normal model (p less than 0.001) and that this model fit the data well. The persons in the age decade 25-34 years showed little evidence of skewness or bimodality. However, the proportion in the upper component (hyperglycemic) increased with each successive age decade, and began to approximate bimodality in the oldest decade (55-64). The minimum misclassification cutpoints decreased with age, but all were higher than the 200 mg/dl cutpoint recommended by the National Diabetes Data Group (NDDG). Use of the NDDG cutpoint, however, improved sensitivity with only a minimal deterioration of specificity. Findings further generalize the bimodality phenomenon and support the NDDG criteria. 5 figures, 4 tables, 38 references.

164

Frequency and Determinants of Screening for Diabetes in the U.S.

Form: Journal article.
Author: Cowie, C.C.; Harris, M.I.; Eberhardt, M.S.
Source: *Diabetes Care.* 17(10):1158-1163, October 1994.

Abstract: Researchers conducted a study to determine the prevalence of risk factors for noninsulin dependent diabetes mellitus (NIDDM) and the frequency of screening for NIDDM in adults in the United States. Investigators administered a detailed questionnaire to a representative sample of 19,680 adults who were at least age 18 years who reported no medical history of diabetes in the 1989 National Health Interview Survey (NHIS). Information was obtained on risk factors for diabetes, complications related to diabetes, and whether the participants had been screened for diabetes in the past year. Women reporting pregnancy in the past year were excluded from analysis. The prevalence of undiagnosed NIDDM according to the frequency of risk factors for NIDDM was determined based on oral glucose tolerance data from the National Health and Nutrition Examination Survey (NHANES) II and Hispanic Health and Nutrition Examination Survey (HHANES). Participants were classified as having diabetes mellitus based on World Health Organization criteria. Standard errors of means and proportion were estimated using the Taylor Series linearization method, standard errors were calculated using the SESUDAAN computer program, and large sample z tests were used to assess whether differences in means and proportions were statistically significant. Prevalence of undiagnosed NIDDM based on the NHANES II and HHANES increased with age, obesity, and family history of diabetes, reaching 11.7 percent in people with all three risk factors. Based on the NHIS, 77.5 percent of United States adults with no medical history of diabetes (131 million people) had at least one risk factor for NIDDM or complication related to NIDDM, and 22.9 percent (38 million people) had three or more risk factors or complications. Approximately 31 percent of adults reported being screened for diabetes in the past year. Screening rates increased with an increasing number of risk factors, but even among those with three risk factors, only 38.6 percent were screened for NIDDM. Results show that more than 7 million United States adults have undiagnosed NIDDM. Nevertheless, screening for diabetes in high-risk groups occurs substantially less frequently than necessary to detect undiagnosed NIDDM and institute appropriate hypoglycemic treatment. 5 figures, 1 table, 24 references.

165

Glycosylated Hemoglobin Determination From Capillary Blood Samples: Utility in an Epidemiologic Survey of Diabetes.

Form: Journal article.
Author: Ferrell, R.E.; Hanis, C.L.; Aguilar, L.; Tulloch, B.; Garcia, C.; Schull, W.J.
Source: *American Journal of Epidemiology.* 119(2):159-166, February 1984.

Abstract: As part of an epidemiologic survey to assess the prevalence of noninsulin dependent diabetes mellitus (NIDDM), researchers measured total glycosylated hemoglobin from capillary blood specimens obtained from a sample of 1,880 individuals of Mexican American ancestry residing in Starr County, Texas. Researchers drew capillary blood samples into heparinized glass tubes following a finger prick, and simultaneously determined blood glucose using the Eyetone Reflectance Colorimeter. If the casual blood glucose was greater than or equal to 130 mg/100 ml, researchers made an appointment with the participant to obtain a 4-hour fasting blood glucose determination. If the latter was greater than or equal to 130 mg/100 ml, researchers scheduled the individual for an oral glucose tolerance test following an overnight fast. Classification of individuals as with or without diabetes conformed to the recommendations of the National Diabetes Data Group (NDDG). Researchers interviewed participants to determine diabetes history and, when possible, confirmed it by a review of the individual's medical records. Capillary blood samples were refrigerated and sent to Houston, Texas, for laboratory analysis, usually obtained within 4 days. Total glycosylated hemoglobin was determined by a modification of the commercial microcolumn chromatography system from Isolab, Inc. Results showed that persons with diabetes had significantly higher levels of glycosylated hemoglobin than persons without diabetes (p less than 0.001). However, among persons with diabetes, results did not show any significant difference between newly-diagnosed cases and those with a history of diabetes, between those taking medication at the time of the survey and those not taking medication, or among individuals taking insulin and those receiving treatment with oral hypoglycemics. An analysis of the specificity and sensitivity of glycosylated hemoglobin, fasting blood glucose, and casual blood glucose determinations revealed that glycosylated hemoglobin is superior to casual blood glucose determination. 4 figures, 1 table, 25 references.

166

Stability Over Time of Modern Diagnostic Criteria for Type II Diabetes.

Form: Journal article.
Author: Stern, M.P.; Valdez, R.A.; Haffner, S.M.; Mitchell, B.D.; Hazuda, H.P.
Source: *Diabetes Care.* 16(7):978-983, July 1993.

Abstract: To examine the long-term stability of the World Health Organization (WHO) diabetes mellitus diagnosis criteria, researchers studied 98 Mexican-Americans and 44 non-Hispanic whites with type two (i.e., noninsulin diabetes mellitus (NIDDM)) 8 years after they were diagnosed according to WHO criteria. A problem with using criteria older than the more stringent WHO criteria for diagnosing diabetes is that many individuals classified as having borderline or chemical diabetes revert to nondiabetes status on followup. The evaluation of the stability of the diagnosis of diabetes was based on whether, in addition to meeting the WHO plasma glucose criteria, other confirmatory evidence existed (e.g., whether the patient was on medication to control diabetes). Researchers used participants from the San Antonio (Texas) Heart Study, 1979-1982 enrollment period. From 1987-1990, researchers reexamined 81 percent of the San Antonio Heart Study population; average duration of followup was 8 years. From 1984-1988, San Antonio Heart Study participants with diabetes were recalled for a diabetes complication examination 2-6 years after the original baseline examination; 105 attended of the 142 whose status at followup was known. During the complications examination, (1) proteinuria was determined with an early morning spot urine with Albustix and (2) retinal photographs were obtained and graded for diabetic retinopathy by the University of Wisconsin Fundus Photographic Reading Center. Of the 142 patients who met the study criteria for NIDDM at baseline and whose status at followup was known, 20 (14.1 percent) no longer met criteria at followup 8 years later. The 20 patients who reverted to nondiabetes status lacked many of the associated anthropometric, physiological, and metabolic findings of diabetes such as obesity, unfavorable body fat distribution, and dyslipidemia. 4 tables, 26 references.

See also 060, 080

Diabetes Clinical Control

Treatment

167

Beneficial Effect of Chromium Supplementation on Serum Triglyceride Levels in NIDDM.

Form: Journal article.
Author: Lee, N.A.; Reasner, C.A.
Source: *Diabetes Care.* 17(12):1449-1452, December 1994.

Abstract: To investigate the effect of chromium picolinate supplementation on the lipid profile of the predominantly Hispanic population of persons with noninsulin dependent diabetes mellitus (NIDDM) in San Antonio, Texas, researchers recruited 30 persons with NIDDM between the ages of 32 and 65 years from the diabetes clinics of the Medical Center Hospital and the Audie Murphy Veterans Hospital in San Antonio. Exclusion criteria included untreated thyroid dysfunction, pregnancy, acute medical or psychiatric illness, renal insufficiency, liver disease, drug or alcohol use, steroid use, and poorly controlled diabetes. Participants who were on a stable dose of lipid-lowering agent for 6 months continued on that therapy. Between June and November 1992, researchers randomly assigned 14 men and 16 women to receive a capsule of chromium picolinate (200 microg/day) or an identical placebo for 2 months. After completion of the initial treatment, participants took no medication for 2 months. Subsequently, researchers crossed over and treated each patient with the alternate capsule for an additional 2 months. A physical examination was performed at study entry and at 2-month intervals. Laboratory analysis at each appointment included (1) a fasting lipid profile, (2) HbA1c, (3) serum chemistries, (4) complete blood count, (5) thyroid function tests, (6) a pregnancy test (if indicated), and (7) serum chromium concentration. Researchers determined serum chromium concentrations using flameless atomic absorption spectrometry and compared these values with total cholesterol levels and fasting blood glucose (FBG) levels using student t-tests. The sample group had an average age of 56 years (range 32-65) and a mean body mass index of 31.2 kg/m2. There were no adverse reactions reported to the chromium therapy. Patient compliance to therapy was excellent, with all patients having less than 10 capsules remaining at the end of each study interval. All but two patients had undetectable levels of serum chromium before study entry, but by the end of 2 months of chromium supplementation all patients had detectable serum levels with a mean concentration of 0.85 microg/L. During the placebo period, there was a 0.6 percent increase in mean body weight versus a 0.2 percent weight increase during chromium supplementation. There was no difference in glucose control between the chromium-treated and placebo groups, as evidenced by similar FBG levels. Cholesterol levels were identical in each group. Serum triglyceride levels were reduced significantly by 17.4 percent after chromium treatment (133 mg/dl versus 161 mg/dl). Long-term studies are needed to determine if the changes in plasma lipids can be maintained. 1 figure, 1 table, 26 references.

168

Impact of Associated Conditions on Glycemic Control of NIDDM Patients.

Form: Journal article.
Author: Ferrannini, E.; Stern, M.P.; Galvan, A.Q.; Mitchell, B.D.; Haffner, S.M.
Source: *Diabetes Care.* 15(4):508-514, April 1992.

Abstract: Researchers conducted a study to assess the impact of associated conditions (obesity, dyslipidemia, and hypertension) on the glycemic control of patients with noninsulin dependent diabetes mellitus (NIDDM) under home-life conditions. They analyzed the metabolic data of 271 patients with NIDDM (63 percent women and 89 percent Mexican American) who were screened in the San Antonio Heart Study. Researchers diagnosed persons with diabetes according to the criteria of the World Health Organization (WHO). Researchers also classified participants as having diabetes who did not meet these criteria but who were receiving treatment with oral antidiabetic agents or insulin. Results showed the presence of obesity in 77 percent of all patients, hypertension in 23 percent, hypertriglyceridemia (serum triglycerides greater than 2.9 mM) in 23 percent, and hypercholesterolemia (serum total cholesterol greater than 6.5 mM) in 14 percent. Only 14 percent of patients with diabetes did not have the other disorders whereas 40 percent had two or more other abnormalities present at the same time. Using a multiple linear regression model, (adjusted for age, sex, ethnicity, waist-to-hip ratio, plasma insulin, and treatment of diabetes and hypertension), the presence of higher serum triglyceride concentrations was associated with significantly higher plasma glucose levels both in the fasting state (1.4 mM, p less than 0.01), and 2 hours after an oral glucose load (1.2 mM, p equal to 0.003). Presence of obesity, hypertension, or high serum cholesterol levels were not associated with significant changes in glycemic control. When researchers stratified the entire group by diabetes treatment and after adjusting for age, sex, ethnicity, and waist-hip ratio, only fasting and 2-hour plasma glucose and insulin concentrations were significantly different across groups, with diet and oral agents associated with higher fasting (p less than 0.001) and postglucose (p less than 0.005) plasma glucose levels and lower plasma insulin concentrations (p less than 0.005) compared with newly-diagnosed patients. Neither serum lipids nor blood pressure differed across treatment. Findings indicate that, in patients with NIDDM under home-life conditions, higher serum triglycerides are associated with higher fasting and postglucose hyperglycemia, regardless of treatment. 2 figures, 3 tables, 33 references.

See also 010, 091

Diabetes Clinical Control

Prevention of diabetes complications

169

Diabetes Care Needs of Hispanic Patients Treated at Inner-City Neighborhood Clinics in New York City.

Form: Journal article.
Author: Engel, S.; Shamoon, H.; Basch, C.E.; Zonszein, J.; Wylie-Rosett, J.
Source: *Diabetes Educator.* 21(2):124-128, March-April 1995.

Abstract: Researchers describe the characteristics of Hispanic origin patients with diabetes served by four urban clinics in New York City, the prevalence of documented comorbidities associated with diabetes, and the adherence to current recommendations for prevention of the chronic complications of diabetes. The clinics' populations were approximately 80 percent Hispanic. Researchers used chart analysis to collect data on 254 patients who (1) were over age 18 years, (2) were diagnosed with diabetes but not gestational diabetes, (3) were explicitly identified as Hispanic or had a Hispanic surname, and (4) had been seen at the clinic within the preceding 2 years. The standardized chart-audit protocol, conducted over a 2-year period, included (1) assessment of diagnosis, (2) key physical examination procedures, (3) risk factors, (4) medication and dietary treatments, (5) laboratory testing, (6) referral for consultative services, and (7) demographic characteristics. The study population was 33 percent male and 67 percent female; mean age was 57.4 years and mean duration of diabetes was 9.2 years. Researchers noted that obesity or overweight occurred in 11 percent of the patients, and hypertension occurred in 54.7 percent of the patients. They identified cholesterol levels above 200 mg/dL in 69 percent of the charts and proteinuria in 16 percent of all charts. The adherence to the American Diabetes Association care standards for visit frequency among patients with diabetes was 71.6 percent for patients with insulin dependent diabetes mellitus and 72.1 percent for patients with noninsulin dependent diabetes mellitus. Blood pressure measurements were performed in 95 percent of patients, weight and height measurements in 95 and 78.3 percent of patients, and foot examinations in 31 percent of patients. Researchers found serum cholesterol measurements in 93 percent of charts, serum triglyceride measurements in 35 percent of charts, and glycohemoglobin levels in 37 percent of charts. Proteinuria results were found in 63 percent of charts and electrocardiogram results in 37 percent of charts over a 2-year period. Evidence of home glucose monitoring was found in 8 percent of charts. Chi-square analysis did not reveal any statistically significant differences between the care provided to those patients who were Hispanic and those from other ethnic groups. Within the Hispanic group, no statistically significant differences were found in the care provided to male and female patients. 2 tables, 33 references.

170

Diabetes Mellitus: A Priority Health Care Issue for Women.

Form: Journal article.
Author: Tinker, L.F.
Source: *Journal of the American Dietetic Association.* 94(9):976-985, September 1994.

Abstract: A researcher examined health issues related to women with diabetes mellitus in the United States. Incidence of diabetes is higher in women than in men; 60 percent of new cases are diagnosed in women. In 1989, diabetes contributed to the mortality of more than 80,000 women either directly or indirectly; African-American women had the highest age-adjusted prevalence of diabetes compared with, in descending order, African-American men, white women, and white men. The prevalence of diabetes in Native Americans, African Americans, and Hispanics is higher than in non-Hispanic whites. Pima Indian women aged 20 to 39 years have the highest incidence of diabetes worldwide, at an age-adjusted prevalence rate of 22.5 percent. Cardiovascular disease is the greatest comorbidity and risk factor for women with diabetes. Cardiovascular disease was listed as the underlying cause of death in 1989 in nearly half the persons with diabetes. Women with diabetes usually have one of the lipid profiles consistent with a high risk of cardiovascular disease: Low levels of high-density lipoprotein cholesterol, small low-density lipoprotein particle size, or high levels of triglycerides. In addition, persons with diabetes tend to be overweight; the prevalence of diabetes is three times higher among persons with body weight more than 140 percent than among persons near their desirable body weight. Women are at a higher risk of being overweight and therefore of developing diabetes than men. Compared to women without diabetes, women with diabetes (1) exhibit a higher prevalence of infections such as vaginitis and urinary tract infections, (2) have a higher risk of endometrial cancer, and (3) are at a higher risk for developing anorexia nervosa and bulimia. Women with insulin dependent diabetes mellitus (IDDM) are at higher risk of developing complications in pregnancy, and pregnancy outcomes improve with preconceptual counseling. Gestational diabetes mellitus occurs in approximately 2 to 3 percent of pregnant women. Low levels of sex-hormone-binding globulin are a risk factor for developing noninsulin dependent diabetes mellitus (NIDDM) in women and are correlated to upper body obesity and general obesity in postmenopausal women. No differences in correlations between hormone levels and upper body obesity were found between Mexican-American women and non-Hispanic white women. Dietetics practitioners are encouraged to use local and national diabetes resources including the American Diabetes Association, the Division of Diabetes Translation of the Centers for Disease Control and Prevention, the Juvenile Diabetes Association International, and the National Diabetes Information Clearinghouse. Both IDDM and NIDDM prevention clinical trials are in progress, although none target women specifically. 5 figures, 102 references.

171

Health Status of Diabetic Mexican Americans: Results From the Hispanic HANES.

Form: Journal article.
Author: Zhang, J.; Markides, K.S.; Lee, D.J.
Source: *Ethnicity and Disease.* 1(3):273-279, Summer 1991.

Abstract: Researchers used data from the Hispanic Health and Nutrition Examination Survey (HHANES) to examine the physical, sociodemographic, and psychosocial health status of Mexican Americans with diabetes aged 45-74 years. Data collection consisted of interviews, physical examinations, body measurements, diagnostic tests, and laboratory analyses. Researchers assessed overall health by asking participants to rate their health as excellent, very good, good, fair, or poor (coded 1, 2, 3, 4, and 5). To assess the presence of chronic conditions, researchers asked participants whether a doctor had ever told them that they had heart failure, heart attack, stroke, kidney problems, glaucoma, or cataracts. They assessed limitation of activity with a series of questions regarding limitation in major activities because of an impairment or health problem. Researchers also calculated body mass index (BMI), measured systolic and diastolic blood pressure, and tested for retinopathy. Depression was measured using the Center for Epidemiologic Studies Depression (CES-D) scale and the Diagnostic Interview Schedule. Sociodemographic variables measured included poverty (coded 1 for falling below the federal poverty line and 0 for all others), employment (full- or part-time coded 1; all others coded 0), and number of years of education. Researchers measured acculturation using an abbreviated version of the unidimensional Acculturation Rating Scale for Mexican Americans. Data analysis concentrated on Mexican Americans age 45-74 years. Analysis of covariance was employed to compute age-adjusted means of acculturation, education, CES-D total score, and BMI. All analyses were conducted with appropriate adjustments for sample weights and design effects. Results showed that Mexican American women with diabetes had lower education levels and lower employment rates in comparison with persons without diabetes. Glaucoma, retinopathy, and activity limitation were more prevalent in men and women with diabetes than in those without diabetes; and women with diabetes also had a higher prevalence of hypertension, kidney problems, and cataracts. Researchers did not find any significant differences in depression levels between Mexican Americans with or without diabetes of either sex, but duration of diabetes was associated with increased prevalence of stroke and activity limitation. 2 tables, 34 references.

172

Providing Culturally Sensitive Health Care to Hispanic Clients.

Form: Journal article.
Author: Caudle, P.
Source: *Nurse Practitioner.* 18(12):40, 43-44, 46, 50-51, December 1993.

Abstract: A researcher (1) provides an overview of Hispanics in the United States, (2) describes prevalent health problems and lack of health care resources among Hispanics, and (3) presents practice implications for providing culturally-sensitive health care to Hispanic clients. Hispanics in the United States are a diverse group of people consisting mostly of Mexican Americans, Puerto Ricans, and Cubans. Health problems of Hispanics include noninsulin dependent diabetes mellitus (NIDDM), injuries and violence, substance abuse, human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS), limited access to health care, and other problems shared by the poor and disenfranchised. Hispanics tend to have less education than other ethnic groups. In 1988, only 50 percent of all Hispanics finished high school. Hispanics also lack political power because they vote less than other groups. Obstacles to health care for Hispanics include lack of insurance and money, language barriers, class and cultural disparities, physicians who are perceived as more interested in money than client welfare, and a lack of Hispanic health care professionals. Health care professionals and health educators should use language appropriate for the cultural group and educational level of the patients they are seeing, including Hispanics. Familialism is a key cultural value among Hispanics. Decision making about health matters is a family affair not left to the ill individual. Machismo or male qualities of dominance and chauvinism and true cultural machismo have been described. Collectivism, the importance of friends and extended family in supporting and advising an ill person, is another shared cultural value. Health care providers can assist Hispanic communities to establish community activities that promote health. In San Diego, California, a state-funded community effort, called Por la Vida, aimed to decrease risks for cardiovascular disease among Mexican Americans. Consejeras, Hispanic women respected in the community, successfully led groups of other Hispanic women who acted as visitors and teachers in the Mexican American community. Health care professionals who know about the culture, customs, mores, beliefs, and language of Hispanics can provide preventive health care for Hispanic clients. 49 references.

See also 168

Psychosocial Aspects of Diabetes

(Descriptions of) Diabetes knowledge, attitudes, beliefs, and practices influencing the personal health-related behaviors of Latinos/Hispanics

173

Health Beliefs, the Significant Other and Compliance With Therapeutic Regimens Among Adult Mexican American Diabetics.

Form: Journal article.
Author: Tamez, E.G.; Vacalis, T.D.
Source: *Health Education.* 20(6):24-31, October-November 1989.

Abstract: The incidence of diabetes mellitus among Mexican Americans is a significant problem and a major health risk for which minimal morbidity and mortality data exist. Adult, hospitalized Mexican American diabetics enrolled in a diabetes education program taught by a bilingual-bicultural instructor were examined for compliance with therapeutic regimens. Subjects were insulin-dependent diabetics who had been diagnosed at least 5 years. Patients were under the care of personal physicians in a 700 bed general hospital at the time of selection. Patients were to reside with a significant other such as spouse, children, siblings, or parents. Patients (n=48) meeting the requirements who were referred for diabetes education were selected for the study and randomly assigned to three equal groups. Significant others (n=48) were simultaneously selected. The factorial research design included factors of group membership for diabetic instruction, health beliefs, and time, with repeated measures on the time factors. Serum glucose, the compliance measure, was monitored over time: Preintervention, postintervention, and post discharge. The background information form used in the structured interview of each subject focused on demographic data. Medical information was obtained during the interviews and through the examination of clinical records. Health beliefs were measured by the Multidimensional Health Locus of Control scale and an 18-item Likert-type instrument. Findings suggest that the identification of health beliefs of Mexican American patients may be important in determining the type of intervention which will generate the most effective compliance. Positive compliance behavior change was a function of time which, when language was not a barrier, may have resulted primarily from medical intervention and the interaction of powerful significant others. 2 figures, 5 tables, 23 references.

174

Mexican Americans: Factors Influencing Health Practices.

Form: Journal article.
Author: Rodriguez, J.
Source: *Journal of School Health.* 53(2):136-139, February 1983.

Abstract: A health educator reviews sociocultural factors relevant to the accessibility and utilization of health care systems among the Mexican American population. Topics addressed are (1) language, (2) socioeconomic status, (3) education, (4) health service availability, (5) folk healers, (6) religion, (7) family structure and stability, and (8) quality and accessibility of health care services. The inability to communicate in English creates problems for Hispanics in general seeking health care and other services. Statistical data confirm that Mexican Americans rank at, or near the bottom of, nearly every measure of socioeconomic success. Many health problems associated with poverty are related to overcrowded living conditions, substandard housing with inadequate or unsanitary facilities, poor nutrition, and stress.

The high stress and frustration levels associated with low income correlate with emotional problems, violence, and self-destructive behavior such as alcoholism and drug abuse. Health care providers who work with low-income populations know that for families unable to purchase health care, the services available to them are often far from adequate. According to a survey on Hispanics' access to medical care based on a national study, Hispanics in the Southwest are less likely than the total population to see a doctor, to have preventive examinations, or to see a dentist. Even when low-income families qualify for free or reduced-fee health care, transportation is often a problem. The Mexican-American family is more inclined to resort to home remedies than is the population as a whole. Neighborhood pharmacists often are relied upon to supply information regarding over-the-counter drugs for relief of toothaches, earaches, coughs, sores, and other maladies. The existence of strong family support systems appears to persist despite educational differences, regional differences, and varying degrees of assimilation into American life. Therefore, some Hispanics may resist treatments involving lengthy periods of separation. When a child requires a long period of hospitalization, a rooming-in arrangement might reduce some of this stress. In the Mexican American home, the male is traditionally considered the head of the household and must be consulted in all matters affecting the family. Both husband and wife should be involved in health counseling or conferences whenever possible. Health care providers and health educators who work with the Mexican-American population should consider outreach programs to increase participation and utilization of their services. 8 references.

See also 011, 017, 020, 021, 026, 033, 086, 148

Psychosocial Aspects of Diabetes

(Descriptions of) Challenges, barriers, and obstacles to effective personal diabetes prevention and management

175

Adult Onset Diabetes Mellitus: Glycemic Control and Family Function.

Form: Journal article.
Author: Cardenas, L.; Vallbona, C.; Baker, S.; Yusim, S.
Source: *American Journal of the Medical Sciences.* 293(1):28-33, January 1987.

Abstract: To test the hypothesis that family function differs in patients according to their level of diabetes control, researchers assessed family function using the Family Adaption, Partnership, Growth, Affection, and Resolve (APGAR) questionnaire in a population of low-income persons with adult-onset diabetes who were under comprehensive care in five community health centers in Houston, Texas. The APGAR questionnaire measures a participant's satisfaction with five components of family function: (1) Adaptation (i.e., utilization of intrafamilial and extrafamilial resources); (2) partnership (i.e., sharing of decision making); (3) growth (i.e., emotional maturation through mutual support); (4) affection (i.e., caring or loving relationship); and (5) resolve (i.e., commitment to devote time to each other). There are three possible responses to each question by each family member: Almost always (2 points), most of the time (1 point), and hardly ever (0 point). Researchers randomly chose 385 participants from among patients who had been diagnosed with diabetes during the 6 months prior to the study and who did not have acute illnesses. The sample was 75 percent female, 48 percent African American, 31 percent Hispanic American, and 21 percent white. Participants ranged in age from 25 to 93 years, with a mean age of 59.1 years. Data about the five components of family function were collected from all participants using personal interviews. Researchers also reviewed each participant's medical chart and recorded the fasting plasma glucose (FPG) values obtained for a period of 6 months prior to the study; the average number of FPG values was 4.2, ranging from 1 to 14. The level of glycemic control was considered to be good when FPG values were between 75 and 140 mg/dl, fair when FPG values were between 141 and 199 mg/dl, and poor when FPG values were over 199 mg/dl in more than 50 of the values obtained in the clinic visits. Based upon this criteria, 80 participants (21 percent) had good glycemic control, 113 (29 percent) had fair glycemic control, and 192 (50 percent) had poor glycemic control. There was no statistically significant difference in the status of glycemic control when related to age, ethnicity, duration of diabetes, extent of obesity, or the health center where the patient received treatment. The mean family APGAR in the sample was 7.4 (range, 0-10). A high proportion of patients with good family function was found among patients who were married and living with their spouse. This proportion was significantly higher than among those who were widowed, divorced, separated, or single. There was no statistically significant difference in the proportion of patients with a dysfunctional family when ethnicity, age, or size of the family were analyzed. An analysis of the family APGAR scores for patients divided into three groups according to the extent of their glycemic control indicated that good family function was characteristic for 92.5 percent of the patients in good control, 66 percent of those in fair control, and 50 percent for those in poor glycemic control. Further studies are needed to determine if an improvement in family function will lead to better diabetes control. 5 tables, 35 references.

176

Depressive Disorders in Primary Care: Prevalence, Functional Disability, and Identification.

Form: Journal article.
Author: Williams, J.W.; Kerber, C.A.; Mulrow, C.D.; Medina, A.; Aguilar, C.
Source: *Journal of General Internal Medicine.* 10(1):7-12, January 1995.

Abstract: Researchers assessed the relative prevalence of subsyndromal depression and major depression in primary care patients and evaluated their associated functional impairments. The study population included patients from three primary care outpatient settings: A university-affiliated Veterans Affairs clinic; a county-supported internal medicine clinic; and a community-based family medicine clinic located in the barrios of San Antonio, Texas. From July through November 1992, the charts of all 538 patients who had scheduled appointments on study days were reviewed for eligibility criteria. Eligible patients were over age 29 years and had no current substance abuse problem, known depressive disorder, or dementia. Using simple random selection, eligible patients were approached for study participation; 221 persons agreed to participate and were screened for depressive symptoms. To collect data, researchers used an eight-item short depression screener (SDS) addressing frequency of depressive symptoms and an instrument (Medical Outcomes Study Short Form 36 (SF-36)) assessing self-perceived general health status. The SDS and SF-36 were administered by a trained bilingual research assistant in either English or Spanish, depending on the participant's preference. The SDS is scored using logistic regression, so the range of possible scores is 0 to 1. Researchers assessed comorbidities and medications through patient chart abstraction. The average age of participants was 60 years, although 38 percent were age 65 years. Household incomes were low, with 83 percent reporting annual incomes under $15,000. Fifty-three percent of the population was Mexican American. There was a high prevalence of chronic medical conditions in the population, including hypertension (57 percent), diabetes mellitus (51 percent), and cardiac disease (28 percent). As determined by the SDS, the prevalences of major depression and subsyndromal depression were 4 percent and 16 percent, respectively. Subsyndromal depression was diagnosed on the basis of DSM-III criteria. The SDS had a sensitivity of 100 percent, a specificity of 72 percent, and a positive likelihood ratio of 3.6 for detecting major depression; its sensitivity, specificity, and positive likelihood ratio for detecting subsyndromal depression were 66 percent, 79 percent, and 3.1, respectively. 1 figure, 3 tables, 32 references.

177

Physician Communication and Patient Compliance.

Form: Journal article.
Author: O'Hair, D.; O'Hair, M.J.; Southward, G.M.; Krayer, K.J.
Source: *Journal of Compliance in Health Care.* 2(2):125-129, Fall 1987.

Abstract: Researchers sought to determine if differences exist in individuals' preferences for strategies used by physicians to gain patient compliance. They investigated whether different ethnic groups (e.g., African Americans, Hispanics, and Asians) varied in their levels of health beliefs and differed in their preferences for physician compliance-gaining message strategies. The study recruited 36 African American, 27 Hispanic, and 51 Asian participants aged 16-98 years from adult and student social organizations at two medium-sized universities in a large metropolitan area in Texas. All participants were

proficient in reading and speaking English. A researcher gave each patient a packet of materials that included (1) instructions, (2) written scenarios involving four physician compliance strategies, (3) preference ratings for each of the scenarios, and (4) a Health Beliefs Test. The four types of physician compliance message strategies were (1) high-affect-high-information; (2) high-affect-low-information; (3) low-affect-high-information; and (4) low-affect-low-information. The health belief instrument was a 5-point, 20-item questionnaire constructed from the dimensions of health beliefs outlined by Becker and Maiman. Independent variables included physician compliance strategy, ethnic group, and health beliefs. All groups preferred compliance strategies that were highest in affectivity and high-information rather than low-information strategies. Furthermore, African Americans were found to possess more strong, deep-seated, and contemporary health beliefs than did Hispanics and Asians. 2 tables, 8 references.

See also 011, 017, 148, 174

Psychosocial Aspects of Diabetes

Family and other social supports

178

NIDDM in Mexican-American Families: Heterogeneity by Age of Onset.

Form: Journal article.
Author: Mitchell, B.D.; Kammerer, C.M.; Reinhart, L.J.; Stern, M.P.
Source: *Diabetes Care.* 17(6):567-573, June 1994.

Abstract: Researchers examined the distribution of diabetes mellitus in 29 Mexican-American families ascertained in a random sample of Mexican Americans residing in low-income neighborhoods in San Antonio, Texas. Each family had a member who had been previously diagnosed with diabetes. Participants came from a previously identified sample that was used in the San Antonio Heart Study. A total of 375 individual family members were evaluated. All individuals participated in a brief medical examination, which included a medical history review, a physical examination, and a 2-hour oral glucose tolerance test. Diabetes was diagnosed according to the World Health Organization (WHO) plasma glucose criteria. Researchers compared prevalence of diabetes among first, second, and third degree relatives of participants and calculated odds ratios for observed versus expected values. The Mantel-Haenszel procedure was used to adjust for differences in age between the two groups. Results showed that among first degree relatives of participants, 72.2 percent of the parents, 36.8 percent of the siblings, and 11.1 percent of the children had diabetes. Among second degree relatives, 44.4 percent of the aunts and uncles, 7.5 percent of the nieces and nephews, and 0 percent of the grandchildren had diabetes. Among the third degree relatives, 13 percent of the cousins and 0 percent of the nieces' and nephews' children had diabetes. Among all first, second, and third degree relatives, the prevalence of diabetes was 28.6, 13.3, and 11.1, respectively. Of a total of 175 first degree relatives, 50 had diabetes. When compared with Mexican Americans with no parental history of diabetes, these results represent an excess of diabetes of 2.0-, 1.3-, 1.1-fold in the first-, second-, and third-degree relatives, respectively. Five of the 29 participants (17 percent) had an age of diabetes onset greater than 40 years. In the first-degree relatives of the early onset participants, diabetes prevalence was 47 percent compared with only 24.1 percent in the first-degree relatives of the 24 late-onset participants. After adjustment for age, this excess represents a 4.98-fold increase in the odds of diabetes among relatives of the early-onset participants. If the 175 relatives had had the same age-specific prevalence rates as the control standard population, then only 25.3 individuals with diabetes would have been expected. 5 tables, 18 references.

See also 011, 017, 175

Psychosocial Aspects of Diabetes

Coping with disease

See 011, 177

Theoretical Models

179

Framework for Community Assessment: Designing and Conducting a Survey in a Hispanic Immigrant and Refugee Community.

Form: Journal article.
Author: Urrutia-Rojas, X.; Aday, L.A.
Source: *Public Health Nursing.* 8(1):20-26, March 1991.

Abstract: Researchers introduce a framework that has been used extensively in national and local surveys for the study of access to medical care, and demonstrate its application to an assessment of health and health care needs in a Hispanic immigrant and refugee community. In the Aday and Andersen framework, characteristics of the population at risk are grouped into (1) mutable and immutable predisposing components (e.g., age, sex, race, marital status, education, English language proficiency, occupation, country of origin and year of arrival, and knowledge and information about health care); (2) mutable and immutable enabling components (e.g., individuals' types of health insurance coverage, sources of health care, available modes of transportation, and family income); and (3) perceived and evaluated need components, which were measured through questions about symptoms of illness and health conditions experienced during the previous year. Access to the health delivery system is reflected in (1) type of service (e.g., hospital, physician, dentist); (2) location at which care was received; (3) purpose of visit (e.g., treatment, preventive, and custodial); (4) time interval (whether or not there was a visit and how many over a certain period of time); and (5) indicators of client satisfaction. Data on these components are usually gathered through surveys of community residents using personal or telephone interviews or mailed questionnaires. In 1987, researchers selected a probability sample of residents in a Hispanic community in Houston, Harris County, Texas, to participate in a study to document systematically whether expanded public health services were needed in the area and, if so, what types of services. Every sixth apartment in 40 apartment complexes was selected for inclusion, resulting in a total sample of 1,605 units. The data presented here are limited to 242 individuals from whom detailed personal interview data were obtained. Bilingual interviewers, all of whom were student volunteers from the University of Texas School of Public Health, administered a questionnaire on a face-to-face basis at the participant's convenience. Most questions were adapted from those asked in a 1976 national survey of access to medical care and from a survey conducted in the lower Rio Grande Valley of Texas. This framework for conducting a community assessment in a primarily Hispanic immigrant and refugee community demonstrates the applicability of well-established survey research to a public health oriented community needs assessment activity. 1 figure, 1 table, 21 references.

Programs (community-based/health system interventions/government)

180
DAR Program Update.

Form: Memo.
Author: Dailey, L.
Source: Alexandria, VA, American Diabetes Association, Bulletin No. 984, 12 p., September 15, 1993.
Availability: American Diabetes Association, 1660 Duke Street, Alexandria, VA 22314. (703) 549-1500.

Abstract: The American Diabetes Association (ADA) sponsors the Diabetes Assistance and Resources (DAR) program, which is a comprehensive, multifaceted, community-based outreach and diabetes information program targeting Hispanics with diabetes or at risk of developing the disease. The targeted subgroups of this population are (1) Mexican Americans, (2) Puerto Ricans, (3) Cuban Americans, (4) Central Americans, and (5) South Americans. Its objectives are to (1) reach out to Hispanics who have diabetes or family members with diabetes through coalition building and (2) encourage Hispanics at high risk to seek early detection and treatment through diabetes home health parties. The eight affiliates of the American Diabetes Association (Arizona, California, Colorado, Florida, New Jersey, New Mexico, Oklahoma, and Texas) build coalitions in the Hispanic community, establish cooperative agreements to ensure that information and resources are available to Hispanic persons contacting the association, and conduct diabetes home health parties as resources permit. Coalition building involves encouraging government, Hispanic organizations, health care providers, diabetes organizations, and industry to sign formal cooperative agreements and share data and resources. Advocacy efforts involve establishing a network of government relations professionals who will introduce and support legislation designed to (1) close the gap in health status between Hispanics and non-Hispanics, (2) improve access to comprehensive diabetes care for Hispanics, (3) increase availability of diabetes education services for Hispanics, (4) improve cultural and linguistic sensitivity and overall quality of diabetes education services for Hispanics, and (5) assist the administration in developing national health objectives as they relate to minorities and diabetes. The diabetes home health parties are conducted by volunteer diabetes lay counselors who are trained by the association in basic diabetes information, nutrition information, tips about physical activity, and local resources and referrals. Program materials include a brochure, a video, a photonovel, a nutrition and exercise guide, and a pictorial newsletter. Hispanic women from the community attend the parties and learn about alternative ingredients and cooking methods that address traditionally Hispanic ways of preparing food. Women who have diabetes or whose family member has diabetes are given information and referrals. At the conclusion of the party, participants are able to (1) list three of the major warning signs, (2) list three ways to improve basic nutrition habits, (3) list three ways of keeping physically active, and (4) list three organizations that can provide them with additional diabetes information and education and/or other sources of health care in their communities. During followup, other family members including Hispanic males are provided with strategies for reducing their risk of developing diabetes such as nutritional alterations and exercise. The diabetes lay counselors also assist persons with diabetes in maintaining a regular source of diabetes care and provide feedback and data for program improvement and change. The following data are being collected to measure the results of the program: (1) Number of women attending the diabetes home health parties, (2) number of local, state, and national organizations joining the coalition, (3) number of women taking the diabetes risk test and seeking diagnosis/treatment, (4) number of women sharing program materials with their families, and (5) number of responses to the customer satisfaction survey. The ADA will train 120 Hispanic women to volunteer as diabetes lay counselors and expects the home health party to reach 1,200 Hispanic women and their families over the next 3 years.

181

Factors Influencing the Development of Area Health Education Centers With Texas-Mexico Border Populations.

Form: Journal article.
Author: Fowkes, V.K.; Fowkes, W.C.; Walters, E.G.; Gamel, N.
Source: *Academic Medicine.* 65(12):762-768, December 1990.

Abstract: Researchers evaluated perceptions about the use of Area Health Education Centers (AHEC's) as an appropriate vehicle for implementing new initiatives for training health professionals who will work along the United States-Mexico border to identify (1) regulatory issues that can be generalized and are relevant to medical schools serving Hispanic areas; (2) other factors in the health science centers (HSC's)/medical schools that are barriers to relationships between them and community agencies; and (3) political, social, economic, or other factors affecting the potential to develop and implement AHEC's in Texas. The national AHEC program's purposes are to improve the distribution, supply, quality, utilization, and efficiency of health professionals in the health service delivery system through education and to encourage schools for health professionals to broaden their teaching responsibilities in a specific geographical region. The study used seven advisers and five consultants, each knowledgeable about AHEC's, to advise investigators about the study design, interview questions, and analysis of the responses. All interviews were conducted by one or more of the three study investigators, each of whom was knowledgeable about developing and implementing AHEC's in Hispanic communities. Perceptions about this program in Texas were evaluated through (1) site visits to five Texas medical schools and five border counties during personal interviews, and (2) telephone interviews that were conducted with people unavailable at the time of site visits and with officials at those Texas medical and osteopathic medical schools that were not visited from July 1988 to June 1989. During the site visits and telephone interviews, 116 people were interviewed; most interviews lasted over 1 hour. Of the 73 school sources, 49 were from medical schools and the remainder were deans and faculty members from other health professions schools, including schools of dentistry, nursing, allied health, and public health. The 31 community respondents were (1) physicians, (2) administrators of community health centers, (3) faculty of local educational institutions, (4) community leaders, and (5) community AHEC directors and board members. Barriers included (1) insufficient components of the health care delivery system to support medical education in severely underserved areas, (2) differing school and community priorities, (3) cultural differences between the school faculty and the community, and (4) feeling among community physicians and dentists that AHEC's were a source of competition. The school and community respondents agreed that the AHEC program needs more cooperative planning and training that emphasizes public health education for future AHEC-like activities with border populations. 1 table, 6 references.

See also 011, 028

Strategies and Approaches

Diabetes self-management

182

Self-Management of Diabetes in a Puerto Rican Population.

Form: Journal article.
Author: Bernal, H.
Source: *Public Health Nursing.* 3(1):38-47, March 1986.

Abstract: Researchers in Connecticut sought to describe the self-management behavior of a group of Puerto Ricans with insulin dependent type two diabetes mellitus. Particular areas of concern were insulin administration, urine testing, and diet therapy. The study used a convenience sample of 74 Puerto Ricans with insulin dependent type two diabetes from the client caseload of the Visiting Nurse and Home Care Agency of Hartford Hispanic unit. Client data were obtained through direct observation and interviews in clients' own homes during 9 months in 1983-1984. Clients who had been visited by the Visiting Nurse Association at least 10 times were chosen from discharged and active files. The study used a revised version of the Bowen diabetes mellitus patient interview schedule, which was constructed to elicit both levels of knowledge and skill of the key aspects of diabetes self-management such as insulin administration and urine testing. Researchers conducted two 24-hour recall interviews 1 week apart to establish dietary patterns. Researchers used household measurements to estimate quantitative information for all food eaten during the previous 24 hours and respondents displayed the cups, glasses, plates, and serving spoons used. Nutrition data was compared with the recommended daily allowances and a 1,500 calorie American Diabetes Association diet for a reference female, aged 23-50 years, 55 kg, 163 cm. Approximately 33-50 percent of the respondents were noncompliant with one or more aspects of the treatment plan. Over 50 percent reported skipping insulin doses; 52 respondents of the 74 varied the time they administered their insulin; and 25 respondents had stopped testing their urine. Meal skipping was reported by the majority: 41 respondents skipped their bedtime snack and 25 skipped breakfast. Quantitative dietary analysis showed close to adequate nutrient intake with the exception of calcium and iron. 8 tables, 27 references.

See also 011, 168, 175

Strategies and Approaches

Information/education/awareness

183

Designing Culturally Relevant Educational Materials for Mexican American Clients.

Form: Journal article.
Author: Hall, T.A.
Source: *Diabetes Educator.* 13(3):281-285, Summer 1987.

Abstract: During the next 50 years, ethnic minority populations in the United States are expected to expand dramatically, especially the Mexican-American population. About 10-12 percent of Mexican-American adults have diabetes. Extensive demographic data substantiate the need for effective nutrition and patient education for Mexican-Americans. However, creating culturally appropriate nutrition and health education materials for America's growing ethnic minority populations requires more than translation of English language materials. Materials need to be adapted, or even redesigned, using concepts, methods, activities, and meal plans that are relevant to the minority culture. The educational package must be very simple in presentation, so that users of all educational backgrounds and with low literacy levels will be able to understand them. Creators of educational materials must be familiar with the language, values, and customs of the target population. Health educators with the California Diabetes Control Program developed Comer Bien para Vivir Mejor (eat well to live better), a nutrition and diabetes education package designed for Mexican-American populations. Patient education materials in the package include illustrated menus, cooking instructions, and guidelines for exercise. All materials reflect Mexican food habits and portray ethnic characters. The package also includes a 70-page guide for health professionals that contains the clinical rationale for dietary modifications, sample lesson plans for teaching behavior change, and cultural and behavioral advice for counseling. The development and field testing of this package are reviewed. 21 references.

184

Transcultural Family Nursing: Applications to Latino and Black Families.

Form: Journal article.
Author: Friedman, M.M.
Source: *Journal of Pediatric Nursing.* 5(3):214-222, June 1990.

Abstract: To effectively provide family nursing, a transcultural perspective must be incorporated. A cross-cultural perspective acknowledges that there are real and fundamental differences among groups in a heterogeneous society like the one in the United States. Each group has its own distinct traditions, culture, lifestyle, and in some cases, language. These unique cultures generate important behavioral differences in their members in such areas as roles, communication, and cognitive styles. Cultural relativity asserts that customs, beliefs, and practices must be judged or understood relative to the context in which they appear. The values every human group holds arise out of that group's historical legacy and can be understood only in that light. Ethnocentrism is the opposite side of the coin to cultural relativity. Holders of an ethnocentric perspective judge other people's behavior and values by their own, believing that their own culture is the standard bearer. Because of the internalization of cultural values and beliefs in one's own socialization process, a propensity to be ethnocentric without realizing it is a natural and pervasive tendency to be consciously avoided. The family is the primary institution in society that preserves and transmits culture. Hence, culturally-derived values greatly influence the family's lifestyle and a cultural assessment is an essential facet of a family assessment. In planning interventions for family problems, nurses need to consider whether planned approaches are congruent with the family's cultural background. Results from ethnic minority research reveal that a dissonance between African-American families' ideology (i.e., belief in two-parent families, a stable marriage, and traditional child rearing) and their lifestyle (e.g., a majority of African-American families are single-parent households and two out of three African-American marriages end in divorce) is created because the African-American male is prevented from fulfilling his normative familial roles of economic provider and family leader. Most African-American families have strong kinship systems, especially within the extended family. African-American families are more likely to live in an extended family than whites. Most African-American families are actively involved in the church and religious life, and both parents are actively involved in child rearing and decision making. The Mexican-American family typically is described as a large and cohesive group including primary kin (siblings, children, and parents) and secondary kin (aunts, uncles, cousins, nieces, nephews, and grandparents). The extended family arrangement includes separate nuclear family residences located in close geographic proximity, with families having frequent contact for social, emotional, and economic support. Religion plays a greater role in assisting Mexican Americans to cope than it does for Anglos. Migration, urbanization, women's labor force participation, social movements such as the feminist and Chicano movements, and educational/socioeconomic mobility have created changing norms within the Latino family (e.g., the diminishing primary authority of the male and greater egalitarianism of spousal roles). 2 tables, 36 references.

See also 011, 172, 179, 180, 181

Strategies and Approaches

Nutrition

See 020, 086, 180

Strategies and Approaches

Support groups/walking groups

185

Hispanic Cultural Values: Implications for Groups.

Form: Journal article.
Author: Delgado, M.
Source: *Small Group Behavior.* 12(1):69-80, February 1981.

Abstract: A researcher presents a brief overview of the literature on Hispanic therapy groups, describes a conceptual framework for examining value orientations within the Hispanic culture, and presents a series of recommendations for group leaders interested in developing Hispanic groups. The limited literature on Hispanic therapy groups addresses four primary areas: (1) Difficulties in developing and maintaining Hispanics in groups; (2) the importance of a bilingual and bicultural group leader to facilitate group formation and process; (3) the necessity in crosscultural situations not to impose external values, attitudes, and culturally alien group techniques; and (4) cognizance of the influence of Hispanic values and their interface with group process. The schema of value orientations developed by Kluckhohn and Strodtbeck lends itself to an examination of specific Hispanic value orientations. Kluckhohn and Strodtbeck identify five clusters of cultural values and their impact on perceptions of problems and solutions: (1) Human nature orientation focuses on perceptions of human qualities and their susceptibility to metaphysical forces; (2) person-nature orientation examines the interface of human beings with their environment; (3) activity orientation places emphasis on earthly behavior; (4) time orientation places importance on time periods; and (5) relational orientation examines the status of various roles and relationships. Using this scheme of value orientations, researchers found that Cuban immigrants and Anglos differed on four out of five clusters (human nature orientation did not change between the groups). Cubans preferred (1) subjugation to nature (versus mastery over nature), (2) present time orientation (versus future time), (3) doing orientation (versus doing and being orientation), and (4) lineal focus (versus individualistic). Hispanic groups may tend toward feelings of fatalism and powerlessness, a preference for concrete solutions (as opposed to insight into personal problems), a present time crisis focus, and authority-suggested solutions involving family (immediate and extended) members. The group leader must (1) be willing to assess a group's religiosity and explore the potential impact of metaphysical forces on problems; (2) explore environmental factors such as unemployment, lack of adequate housing, and the prevalence of crime; (3) invoke short-term, easily measurable goals; (4) stress current problems and solutions; and (5) provide interpretations and suggestions for possible solutions. As Szapocnik et al. have indicated, therapeutic models must take into account cultural variables as an important set of client characteristics to attract and maintain clients in treatment. 2 tables, 26 references.

See also 011, 086, 180

Health Care Delivery System Issues

Medical insurance, coverage, and reimbursement

186
Executive Summary.

Form: Report.
Corporate Author: Labor Council for Latin American Advancement. National Council of La Raza.
Source: IN: *Hispanics and Health Insurance, Volume 1: Status.* Labor Council for Latin American Advancement. National Council of La Raza. Washington, DC, National Council of La Raza, pp. i-vi, March 1992.
Availability: National Council of La Raza, 810 First Street, NE., Suite 300, Washington, DC 20002. (202) 289-1380.

Abstract: Hispanics and Health Insurance, a report by the Labor Council for Latin American Advancement and the National Council of La Raza, provides a chartbook on Hispanic status with regard to Hispanic health insurance. The report uses a variety of official data sources including the March 1991 Current Population Survey conducted by the Census Bureau. Hispanic Americans are the youngest and least educated minority group, and the group most likely to be among the working poor. Hispanics are less likely than either whites or African Americans to have any health insurance coverage (32.4 percent of the Hispanic population were uninsured in 1990, compared with 12.9 percent of whites and 19.7 percent of African Americans). A total of 48 percent of Hispanic Americans are covered by private health insurance, compared to 76.7 percent of whites and 51.8 percent of African Americans. Low-income Hispanics are less likely than low-income African Americans though more likely than low-income whites to receive Medicaid (44.7 percent, 57.8 percent, and 39.3 percent, respectively). The number of uninsured Hispanic Americans rose from 5.59 million to 6.95 million between 1985 and 1990, while the number of uninsured whites and African Americans decreased during the same period from 29.31 million and 6.37 million to 26.90 million and 6.07 million, respectively. Hispanic Americans aged 18 years to 24 years are more likely to be uninsured than any other age group (48.0 percent uninsured in 1990, compared to 24.7 percent whites and 33.7 percent African Americans in the same age group). Hispanic-American children are over twice as likely to be uninsured as white children and nearly twice as likely to be uninsured as African-American children (28.3 percent of Hispanic-American children compared with 12.5 percent of white children and 14.4 percent of African-American children). In 1990, among Hispanic subgroups, Central and South Americans (40 percent) and Mexican Americans (36 percent) are most likely to be uninsured, and Puerto Ricans (14 percent) are least likely to be uninsured; 24 percent of Cuban Americans and 21 percent of other Hispanics lacked health insurance. Cuban Americans, the Hispanic subgroup with the highest median age, are twice as likely to receive Medicare benefits as are other Hispanic subgroups. In 1990, 69.4 percent of adult Hispanic males who were employed but whose earnings did not exceed poverty level lacked health insurance, compared with 63.9 percent comparable African-American males and 54.9 percent comparable white males; 53.4 percent of Hispanic working poor women were uninsured, compared with 40.0 percent comparable white women and 35.6 percent comparable African-American women. Hispanics are overrepresented among the working poor and near poor, unable to afford private coverage, less likely to obtain coverage from an employer, and ineligible for public insurance coverage. Making health care available and affordable for Hispanics requires

addressing the special conditions of Hispanic Americans: Young, very high male labor force participation rates, heavily represented among the working poor, and often living in states that provide very limited Medicaid coverage.

187

Health Insurance Coverage and Utilization of Health Services by Mexican Americans, Mainland Puerto Ricans, and Cuban Americans.

Form: Journal article.
Author: Trevino, F.M.; Moyer, M.E.; Valdez, R.B.; Stroup-Benham, C.A.
Source: *Journal of the American Medical Association (JAMA).* 265(2):233-237, January 9, 1991.

Abstract: To derive estimates of the level of insurance coverage and use of medical services, researchers examined data on 13,000 Mexican Americans, Puerto Ricans, and Cuban Americans aged 6 months to 74 years. Researchers used data from two cross-sectional surveys: The Hispanic Health and Nutrition Examination Survey (HHANES), conducted between 1982-1984, and the 1989 Current Population Survey (CPS). The CPS collects statistics each month for the U.S. Bureau of the Census on the number of employed and unemployed persons in the United States. Researchers used data for the white and African American non-Hispanic populations and the three Hispanic national origin groups (Mexico, Puerto Rico, and Cuba). Descriptive statistics, primarily chi square and t-tests, were used to examine the reported health services utilization and health insurance coverage of the three Hispanic national origin groups. Results revealed that over one-third of the Mexican American population, one-fifth of the Puerto Rican population, and one-fourth of the Cuban American population were uninsured for medical expenditures compared with one-fifth of the African American, non-Hispanic population and one-tenth of the white, non-Hispanic population. Compared with Hispanics with private health insurance, uninsured Hispanics were less likely to have a regular source of health care, less likely to have visited a physician in the past year, less likely to have had a routine physical examination, and less likely to rate their health status as excellent or very good. Fewer Puerto Ricans were uninsured because almost one-third (32.5 percent) participated in the Medicaid program, compared with only 14 percent of Mexican Americans and 12 percent of Cuban Americans. Cuban Americans were more likely to have private health insurance (56 percent compared with 44 percent). Among the uninsured, Mexican Americans were three times more likely than Cuban Americans and almost four times more likely than Puerto Ricans to have never had a routine physical examination (29.5 percent, 9.9 percent, and 7.7 percent, respectively). Among the uninsured, 53 percent of Mexican Americans, 60 percent of Cuban Americans, and 46 percent of Puerto Ricans were gainfully employed; however, 53 percent of Mexican Americans, 40 percent of Cuban Americans, and 47 percent of Puerto Ricans were living at the poverty level. 4 figures, 2 tables, 11 references.

188

Influence of Outpatient Insurance Coverage on the Microvascular Complications of Non-Insulin-Dependent Diabetes in Mexican Americans.

Form: Journal article.
Author: Pugh, J.A.; Tuley, M.R.; Hazuda, H.P.; Stern, M.P.
Source: *Journal of Diabetes and Its Complications.* 6(4):236-241, October-December 1992.

Abstract: Researchers sought to determine the influence of outpatient insurance coverage on the microvascular complications of noninsulin dependent diabetes mellitus (NIDDM) in Mexican Americans. Using Mexican-American participants with diabetes identified from the San Antonio (Texas) Heart Study (1979-1982, 1984-1988), researchers assessed two microvascular complications: (1) Nephropathy as manifest by proteinuria and microalbuminuria, and (2) retinopathy. Both clinical proteinuria and microalbuminuria were measured in an early morning spot urine sample. Clinical proteinuria was measured at the time of a diabetes complications examination with Albustix. Microalbuminuria was determined an average of 12 months later by an immunoturbidometric method. Stored specimens were available on 199 Mexican-Americans and 44 non-Hispanic whites with diabetes. Retinopathy was evaluated using seven stereoscopic fundus photographs of each eye, obtained by certified photographers using procedures adapted from the Early Treatment of Diabetic Retinopathy Study. Indicators of health care access used in the study included (1) regular source of care, (2) public or private source of care, (3) health insurance, and (4) type of health insurance coverage. This information was obtained in an interview at the complications exam. Among Mexican-American participants with NIDDM diagnosed prior to their participation in the survey, 26 percent lacked any type of health insurance, and 28 percent relied on county or federally funded clinics rather than private doctors as their primary source of care. Microvascular complications were more common among those who received their health care from a clinic versus a private doctor, and among those who lacked health insurance coverage for outpatient doctor visits and medications. 4 figures, 23 references.

189

Insurance Coverage and Usage of Preventive Health Services.

Form: Journal article.
Author: Hopkins, R.S.
Source: *Journal of the Florida Medical Association.* 80(8):529-532, August 1993.

Abstract: An epidemiologist reports on the 1991 Florida Behavioral Risk Factor Survey (BRFS), which included 2,246 respondents to a random-digit-dial telephone survey. The State Health Office, Florida Department of Health and Rehabilitative Services, has conducted an annual Behavioral Risk Factor Survey since 1987 to ascertain the prevalence of risk factors for chronic disease and injury and the use of key preventive health care services. In 1991, researchers asked respondents about (1) the type and extent of their health insurance coverage, (2) whether they had missed a visit to a doctor because of expense, (3) their use of mammography and the Papanicolaou (Pap) smear test, and (4) their smoking behavior. The 1991 Florida BRFS was administered to noninstitutionalized adults over 17 years of age. Results were weighted to census data so that they represent the adult population of the state by age, race, and sex. While 80.8 percent of Florida adults say they have some health insurance, 19.2 percent say they have none. This corresponds to 1.9 million adults without any health insurance. Coverage varies by age and ethnicity. Under age

40 years, 70.1 percent of respondents have health insurance, while 92.9 percent those over age 59 years have coverage. Coverage in all age groups is 67.5 percent for Hispanic whites; 71.5 percent for African Americans; and 84.6 percent for non-Hispanic whites. An overall total of 14.1 percent answered affirmatively to the question: Was there a time during the last 12 months when you needed to see a doctor, but could not because of the cost? Women were slightly more likely than men to report this problem (15.9 percent versus 12.1 percent). People without health insurance or with insurance that does not cover outpatient or preventive services are less likely than fully insured persons to see a doctor for a checkup (63.2 percent versus 76.3 percent, respectively) and less likely to receive common preventive services like mammography and Pap smear tests (32.9 percent versus 56.2 percent, respectively). 4 figures, 2 references.

190

Medical Expenditures and Insurance Coverage for People With Diabetes: Estimates From the National Medical Care Expenditure Survey.

Form: Journal article.
Author: Taylor, A.K.
Source: *Diabetes Care.* 10(1):87-94, January-February 1987.

Abstract: Researchers examined the extent and breadth of public and private health insurance for individuals with diabetes and provided estimates of this population's use of health-care services and their mean expenses for this care, using data from the 1977 National Medical Care Expenditure Survey (NMCES). Researchers chose this survey as the only data set available containing detailed information on insurance coverage and both medical-care use and expenditures. The survey provided detailed national estimates for the civilian noninstitutionalized population in the United States on the use of health services, health expenditures, and health insurance coverage, in addition to sociodemographic and economic information based on the 40,000 individuals in the sample. Researchers identified use of and expenditures for health services and sociodemographic characteristics of individuals and families from data obtained in the household survey, which they conducted over five rounds of interviewing. Estimates of private health insurance coverage and premiums, type of policy, and sources of premium payment were based on the Health Insurance Employer Survey (HIES). Researchers obtained information from household respondents on participation in public programs such as Medicare and Medicaid. They obtained information on the benefits offered under Medicare, CHAMPUS/CHAMPVA, and each state's Medicaid program in 1977 from administrative sources and coded it onto the same forms used for private insurance. Results showed that 12 percent of all patients with diabetes under age 65 years (311,000 individuals) were uninsured throughout 1977, a rate not much different from that for the rest of the United States population. Those with diabetes who were uninsured tended to be younger, African American, or Hispanic, in excellent or good health, and live outside of metropolitan areas and in the South or West. Individuals with diabetes used more medical care than others of their age and sex and their medical expenses were much higher, especially in younger age groups. In 1977, average total medical care expenses for people with diabetes were $1,514 compared with $548 for the rest of the population. They and their families paid approximately 20 percent of their total medical charges out-of-pocket (approximately $355). On average, private insurance paid 24 percent, Medicare 32 percent, Medicaid 12 percent, and other payers 10 percent. Their health insurance premiums, however, were similar to people without diabetes, averaging $1,000 in 1977 for those under age 65 years. Data from the National Medical Care Expenditure Survey show that the cost and coverage of health insurance for the population with diabetes in 1977 was similar to that for others in the general population. 7 tables, 10 references.

See also 011, 017, 022, 024, 040

Health Care Delivery System Issues

Access to care

191

Access to Health Care for Hispanics.

Form: Journal article.
Author: Ginzberg, E.
Source: *Journal of the American Medical Association (JAMA).* 265(2):238-241, January 9, 1991.

Abstract: A researcher considers factors that determine the access of Hispanics to the health care system and discusses changes that, if introduced, would contribute to its improvement. Issues addressed include (1) the homogeneity or heterogeneity of the Hispanic population, (2) the extent to which socioeconomic status adversely affects Hispanics' access to health care, (3) the influence of demographic and epidemiological factors on their needs for care, (4) the role of neighborhood factors in determining their access to the health and medical infrastructures, (5) the paucity of Hispanic health professionals, and (6) the major health reform proposals currently on the nation's health agenda as they relate to the issue of improved access to care for Hispanics. The subgroups of the Hispanic population and their proportional representation are as follows: Mexican American (62 percent), Puerto Rican (13 percent), Cuban (5 percent), Central and South American (12 percent), and other Hispanics (the Spanish-Mexican-Indian population in the Southwest) (8 percent). A particular disadvantage of the Hispanic population is the large gap between their level of educational achievement and that of the white majority, which is reflected in less-favorable occupational status and lower incomes. Many Hispanics are employed in low-wage sectors of the economy where employers fail to provide health insurance benefits. Mexican Americans and Puerto Ricans have a much higher incidence of noninsulin dependent (type II) diabetes mellitus, approximately two to three times that of the non-Hispanic population. This disease also strikes a younger age group and often leads to complications that have been linked in part to difficulties in obtaining adequate health care. Hispanics' concentration in low-income areas also carries the presumption of a lower quality of care than that available in higher-income areas. Hispanics are underrepresented in the health professions. Hispanic dentists, registered nurses, pharmacists, and therapists accounted in 1989 for between 2.2 and 3 percent of the totals, and physicians accounted for 5.4 percent. Efforts to reduce the gap between the needs of Hispanic users and the availability of Hispanic health care providers include health education programs conducted by community groups, especially the distribution of materials in Spanish. Currently, the most widely-debated health reform is employer mandating, either by the federal government or by the states. However, employers may hire part-time employees to avoid providing mandated health coverage or even close down their establishments entirely, thus jeopardizing the jobs of many Hispanics. 1 table, 16 references.

192

Access to Medical Care for Documented and Undocumented Latinos in a Southern California County.

Form: Journal article.
Author: Hubbell, F.A.; Waitzkin, H.; Mishra, S.I.; Dombrink, J.; Chavez, L.R.
Source: *Western Journal of Medicine.* 154(4):414-417, April 1991.

Abstract: To determine local access to medical care among Latinos, researchers conducted telephone interviews with residents of Orange

County, California, during October 1987 and February 1988. The survey replicated on a local level the national access surveys sponsored by the Robert Wood Johnson Foundation. The study compared access and analyzed predictors of access among 871 families, including 137 Latino citizens of the United States (including permanent legal residents), 54 undocumented Latinos, and 680 Anglos. The questionnaire consisted of closed and open ended questions that focused on demographic characteristics, access to care, and health status. Researchers classified all respondents who identified their ethnicity as Mexican, Chicano, or Latino as Latino for purposes of the study. Because of the sensitive nature of questions about immigration status, these questions were asked at the end of the survey after reassuring respondents that their answers would remain confidential. Specially trained bilingual interviewers from the University of California, Irvine, Center for Survey Research conducted the survey. They chose as the respondent the adult member of a household who had the most knowledge about the health care of the family. Interviewers gave the respondents the option of completing the questionnaire in either English or Spanish. The survey took about 22 minutes to complete. Researchers used descriptive statistics to provide an overview of the results; the two-tailed t-test to analyze dichotomous variables; and logistic regression to evaluate the relative contributions of ethnicity, income, health insurance, employment, and health status in predicting access to medical care. Compared with Anglos, Latino citizens and undocumented immigrants had less access to medical care by all measures used in the survey. Logistic regression, with control for age, sex, employment status, health status, and income, revealed that although Anglo versus Latino ethnicity did not emerge as a strong predictor of access, insurance status was a very strong predictor. Although undocumented Latinos were less likely than Latino citizens to have health insurance, by most other measures their access did not differ significantly. 3 tables, 13 references.

193

Ethnic Minorities and Access to Medical Care: Where Do They Stand?

Form: Journal article.
Author: Cornelius, L.J.
Source: *Journal of the Association for Academic Minority Physicians.* 4(1):16-25, January 1993.

Abstract: A researcher presents data collected in the National Medical Expenditure Survey (NMES) for 1987 to examine how African Americans, Asian Americans, and Hispanic Americans fare relative to whites on measures of access to medical care. The NMES is sponsored by the U.S. Department of Health and Human Services and is part of a series of national health care expenditure surveys. The 1987 NMES used a national probability sample of the United States civilian, noninstitutionalized population. A sample of 15,000 households was selected, producing a total of 36,400 respondents. The survey was fielded in four rounds, with interviews conducted at 4-month intervals to collect information on insurance coverage, use of services, expenditures, and sources of payment for the period from January 1 to December 31, 1987. A short telephone interview obtained tax filing and other supplementary information. Classification by ethnic or racial background was based on information reported for each household member. The categories of white and African American were formed by placing only those whites and African Americans who were also not Hispanic American in their respective groups. The study found that while only 4.4 percent of the United States population regularly used an outpatient department or emergency room in 1987, 9.9 percent of Hispanic Americans, 15.8 percent of African Americans, and 14.5 percent of Asian Americans regularly used a hospital-based site for their medical needs. Whereas 14 percent of all Americans were uninsured, 21 percent of African Americans and 32 percent of Hispanic Americans were uninsured. The authors identify barriers to health care for minorities, including insurance, income, age, education, and usual source of care. 5 figures, 4 tables, 24 references.

194

Improving Access to Health Care in Latino Communities.

Form: Journal article.
Author: Valdez, R.B.; Giachello, A.; Rodriguez-Trias, H.; Gomez, P.; de la Rocha, C.
Source: *Public Health Reports.* 108(5):534-539, September-October 1993.

Abstract: This background paper (1) discusses why Latinos fail to receive the medical care they need; (2) highlights recommendations proposed by scholars, community organizations, and providers for lowering barriers to care; and (3) proposes strategies for implementing reforms. Access to appropriate medical care for Hispanic Americans is reduced by numerous financial, structural, and institutional barriers. Financial barriers include the lack of health insurance coverage and low family incomes common in Latino communities. More than 7 million Latinos younger than age 65 years (39 percent) do not have health insurance coverage. Structurally, the delivery system rarely reflects the cultural or social concerns of the communities where services are located. The lack of community outreach efforts and the limited presence of Latinos in planning and managing health care services create barriers to medical care. Four specific recommendations are offered. Recommendation one involves modifying governmental and institutional policies by eliminating or reducing eligibility restrictions for Medicaid coverage, developing cooperative agreements for targeting services for Latino communities, improving the infrastructure, recruiting Latinos into decision-making positions, and establishing universal health care coverage. Recommendation two involves expanding the supply of culturally-competent providers by offering educational grants or subsidies in the health professions for the advanced training of Latinos and others to practice in Latino communities and creating community-based health centers. Recommendation three involves restructuring incentives to ensure primary care and health services by adopting reimbursement policies rewarding primary and preventive care, rewarding the development of community-based, consumer-sponsored comprehensive health plans, and increasing the sensitivity of public health and other government officials. Recommendation four involves enhancing services to offer transportation, child care, availability of care during weekend and evening hours, mental health, substance abuse, long-term care, community outreach, case management, and health education, and promote change in the institutional culture to reward service to and respect for the client. Considerations for implementation include (1) targeting states with large Latino populations; (2) educating newly-elected Latino officials about health issues and urging faculty at schools for the health professions to recognize the importance of cultural competency issues; and (3) developing national Latino images recognizable to the American public by gaining seats on the boards of financial institutions, insurance companies, and large health care organizations. 48 references.

See also 009, 011, 017, 022, 181, 189

Policy/Legislation (health care reform, etc.)

195

Health Issues at the U.S.-Mexican Border.

Form: Journal article.
Author: Warner, D.C.
Source: *Journal of the American Medical Association (JAMA)*. 265(2):242-247, January 9, 1991.

Abstract: A researcher presents an overview of health issues at the United States/Mexican Border, including the changing border population and its health status and health systems, entitlements, and cross-border utilization. Some observers believe that the total 1990 population of the United States/Mexico border area was 10 million. Many border residents live in unincorporated settlements on both sides of the border. These communities often lack septic tanks, sewers, or running water. In addition, outdoor privies often are next to water wells, making the water unfit for consumption. Contaminants from the maquiladoras (United States industrial plants on the Mexican side of the border) flow in surface water or underground aquifers. Mortality rates by age for the Texas border counties are lower than those for the rest of Texas and the United States overall. For all races in the age group 15-44 years, death rates in 1985 were 137.3 per 100,000 persons in the United States, compared with 119 per 100,000 in the border area and 154 per 100,000 in Texas alone. Fertility rates in the border area, although well above United States rates, have declined sharply during the last 2 decades. For females aged 15-44 years, fertility rates dropped from 215 births per 1,000 in 1974 to 127 per 1,000 in 1986. Few newborns have low birth weight among Mexican Americans on the border or elsewhere. During the last decade, infant mortality on the United States side of the border has been at or below the rate for the non-Hispanic white population in the United States as a whole. Communicable diseases pose a significant threat to the health of people in the border area. Drug-resistant tuberculosis remains a problem on the Mexican side of the border. Sexually transmitted diseases have long been a problem, not only due to the cross-border use of red light districts, but also because contact tracing is much more difficult. On the United States side of the border, the medical care system has many of the characteristics of the United States system as a whole, although most of the cities have limited entitlements. A recent survey showed that more than one-fourth of low-income respondents in the Rio Grande Valley annually went to Mexico for pharmaceuticals. Also, 15 percent had received medical services and 10 percent had received dental services in Mexico the previous year, due to a lower cost in Mexico. Although in theory Mexico has a national health system, in fact there are many gaps in access similar to those in the United States. Persons with a high income have access to private facilities and practitioners, whereas the broad middle class generally has access to Social Security or government employee clinics and hospitals. Many of the problems on the border could be diminished if both countries sought to improve the environment, provide access to basic health care, and strengthen public health activities. Proposed solutions include (1) binational public health programs in communicable disease control, health services provision, environmental sanitation, and systems development, planning, and administration; (2) nongovernmental binational medical professional cooperation and program development; (3) activities of binational councils of the United States-Mexico Border Health Association to coordinate policy on public health activities and encourage improved communication and standards between health departments across the border; and (4) an enhanced role of universities in providing personal health services on both sides of the border, including binational clinical collaboration. 43 references.

See also 004, 011

State-based Programs to Reduce the Burden of Diabetes

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Title Index

The numbers in this index refer to item numbers not to page numbers.

Access to Health Care for Hispanics. 191
Access to Medical Care for Documented and Undocumented Latinos in a Southern California County. 192
Acculturation and Compliance With Medical Therapy. 7
Accuracy of Reported Family History of Diabetes Mellitus: Results From San Luis Valley Diabetes Study. 160
Adult Onset Diabetes Mellitus: Glycemic Control and Family Function. 175
Aggregation of Physical Activity Habits in Mexican-American and Anglo Families. 87
Americans of Latin Descent. 1
Analysis of HLA-DQA1 and -DQB1 Genes in Mexican Americans With Insulin-Dependent Diabetes Mellitus. 34
Ancestral Origin of Insulin-Dependent Diabetes in Mexican-Americans. 35
Antithyroid Antibodies in Hispanic Patients With Type I Diabetes Mellitus: Prevalence and Significance. 36
Apolipoprotein A-IV Genetic Polymorphism and Its Impact on Quantitative Traits in Normoglycemic and Non-Insulin-Dependent Diabetic Hispanics From the San Luis Valley, Colorado. 152

Beneficial Effect of Chromium Supplementation on Serum Triglyceride Levels in NIDDM. 167
Black Magic Beliefs and White Magic Practices: The Common Structure of Intimacy, Tradition, and Power. 8
Blood Pressure, Insulin, and C-Peptide Levels in San Luis Valley, Colorado. 50

Cardiovascular Risk Factors and Impaired Glucose Tolerance: The San Luis Valley Diabetes Study. 116
Cardiovascular Risk Factors in Confirmed Prediabetic Individuals: Does the Clock for Coronary Heart Disease Start Ticking Before the Onset of Clinical Diabetes? 125
Cardiovascular Risk Factors in Mexican Americans in Laredo, Texas: I. Prevalence of Overweight and Diabetes and Distributions of Serum Lipids. 126
Clinical Characteristics of IDDM in Hispanics and Non-Hispanic Whites: Little Evidence of Heterogeneity by Ethnicity. 37
Clinical Gallbladder Disease in NIDDM Subjects: Relationship to Duration of Diabetes and Severity of Glycemia. 149
Colorado IDDM Registry: Lower Incidence of IDDM in Hispanics: Comparison of Disease Characteristics and Care Patterns in Biethnic Population. 38
Comparison of Adiposity Measures for Screening Non-Insulin Dependent Diabetes Mellitus. 93
Comparison of Three Methods for Assessing Amerindian Admixture in Mexican Americans. 108
Congenital Rubella Syndrome as a Model for Type 1 (Insulin-Dependent) Diabetes Mellitus: Increased Prevalence of Islet Cell Surface Antibodies. 39
Cultural Considerations: Developing a Nursing Care Delivery System for a Hispanic Community. 9
Cultural Heterogeneity of Mexican-Americans and Its Implications for the Treatment of Diabetes Mellitus Type II. 10

DAR Program Update. 180
Decreased Prevalence of Hypertension in Mexican-Americans. 127
Delayed Diagnosis of Diabetic Retinopathy in Black and Hispanic Patients With Diabetes Mellitus. 144
Depressive Disorders in Primary Care: Prevalence, Functional Disability, and Identification. 176
Designing Culturally Relevant Educational Materials for Mexican American Clients. 183
Detection and Management of Gestational Diabetes in an Out-of-Hospital Birth Center. 143
Determinants of Regular Source of Health Care in Black, Mexican, Puerto Rican, and Non-Hispanic White Populations. 22

Diabetes Alert Study: Weight History and Upper Body Obesity in Diabetic and Non-Diabetic Mexican American Adults. 94

Diabetes Among Mexican Americans in Starr County, Texas. 51

Diabetes and Coronary Heart Disease Risk in Mexican Americans. 128

Diabetes and Disability Among Mexican Americans: The Effect of Different Measures of Diabetes on Its Association With Disability. 161

Diabetes and Impaired Glucose Tolerance in Women Aged 20-39 Years. 117

Diabetes Care Needs of Hispanic Patients Treated at Inner-City Neighborhood Clinics in New York City. 169

Diabetes, Gallbladder Disease, Obesity, and Hypertension Among Hispanics in New Mexico. 95

Diabetes in Adults Is Now a Third World Problem. 53

Diabetes in Hispanic Americans. 40

Diabetes in Hispanic Americans: Current Research and Education Programs. 11

Diabetes in Pregnancy in Mexican Americans. 75

Diabetes Mellitus: A Priority Health Care Issue for Women. 170

Diabetes Mellitus After Renal Transplantation in the Cyclosporine Era: An Analysis of Risk Factors. 135

Diabetes Mellitus and Cigarette Smoking: Findings From the 1989 National Health Interview Survey. 124

Diabetes Mortality Among New Mexico's American Indian, Hispanic, and Non-Hispanic White Populations, 1958-1987. 52

Diabetic Retinopathy in Mexican Americans and Non-Hispanic Whites. 145

Differences in the Prevalence of Diabetes and Impaired Glucose Tolerance According to Maternal or Paternal History of Diabetes. 109

Different HLA Haplotypes in Mexican Americans With IDDM. 41

Diminished Insulin Sensitivity and Increased Insulin Response in Nonobese, Nondiabetic Mexican Americans. 96

Do Anthropometric Differences Between Mexican Americans and Non-Hispanic Whites Explain Ethnic Differences in Metabolic Variables? 110

Do Upper-Body and Centralized Adiposity Measure Different Aspects of Regional Body-Fat Distribution? Relationship to Non-Insulin-Dependent Diabetes Mellitus, Lipids, and Lipoproteins. 89

Does Glycemic Control of Type II Diabetes Suffice to Control Diabetic Dyslipidemia? A Community Perspective. 90

Does Obesity Explain Excess Prevalence of Diabetes Among Mexican Americans? Results of the San Antonio Heart Study. 97

Effect of Cultural Beliefs on the Treatment of Native Peoples With Diabetes and Visual Impairment. 12

Effect of Socioeconomic Status on Hyperglycemia and Retinopathy Levels in Mexican Americans With NIDDM. 23

Effects of Acculturation and Socioeconomic Status on Obesity and Diabetes in Mexican Americans: The San Antonio Heart Study. 13

Effects of Social Structure and Culture on Reported Health. 14

Eight-Year Incidence of Hypertension in Mexican-Americans and Non-Hispanic Whites: The San Antonio Heart Study. 129

Empirical Scale to Measure Type and Degree of Acculturation in Mexican-American Adolescents and Adults. 15

End-Stage Renal Disease in U.S. Minority Groups. 136

Epidemiological Correlates of NIDDM in Hispanics, Whites, and Blacks in the U.S. Population. 54

Epidemiology and Immunogenetics in Recently Diagnosed Venezuelan Children With Insulin-Dependent Diabetes Mellitus. 42

Essential Hypertension: An Insulin-Resistant State. 130

Ethnic Differences in Human Leukocyte Antigen Markers of Susceptibility to IDDM. 43

Ethnic Differences in Risk Factors Associated With the Prevalence of Non-Insulin-dependent Diabetes Mellitus: The San Luis Valley Diabetes Study. 55
Ethnic Migration, Assimilation, and Consumption. 16
Ethnic Minorities and Access to Medical Care: Where Do They Stand? 193
Evaluation of Epidemiology and Immunogenetics of IDDM in Spanish- and Portuguese-Heritage Registries: A Key to Understanding the Etiology of IDDM? 44
Evaluation of Three Potential Screening Tests for Diabetes Mellitus in a Biethnic Population. 162
Evidence for a Major Gene Affecting Postchallenge Insulin Levels in Mexican-Americans. 153
Evidence of Bimodality of Two Hour Plasma Glucose Concentrations in Mexican Americans: Results From the San Antonio Heart Study. 163
Excess Incidence of Known Non-Insulin-Dependent Diabetes Mellitus (NIDDM) in Hispanics Compared With Non-Hispanic Whites in the San Luis Valley, Colorado. 56
Excess Incidence of Treatment of End-Stage Renal Disease in Mexican Americans. 137
Executive Summary. 186

Factors Associated With Retinal-Vein Occlusion in Hispanics. 146
Factors Influencing the Development of Area Health Education Centers With Texas-Mexico Border Populations. 181
Factors Related to Diabetes Mellitus in Puerto Rican Men. 31
Family Health Project: Cardiovascular Risk Reduction Education for Children and Parents. 131
Family Structures in an Urban Puerto Rican Community. 2
Feeding the Hispanic Hospital Patient: Cultural Considerations. 83
Framework for Community Assessment: Designing and Conducting a Survey in a Hispanic Immigrant and Refugee Community. 179
Frequency and Determinants of Screening for Diabetes in the U.S. 164

Gastric Emptying in Mexican Americans Compared to Non-Hispanic Whites. 57
Genetic and Environmental Determinants of Type II Diabetes in Mexico City and San Antonio. 111
Genetic Studies of Type 2 (Non-Insulin-Dependent) Diabetes Mellitus: Lack of Association With Seven Genetic Markers. 154
Gestational Diabetes Mellitus: Influence of Race on Disease Prevalence and Perinatal Outcome in a U.S. Population. 76
Global Estimates for Prevalence of Diabetes Mellitus and Impaired Glucose Tolerance in Adults. 118
Glucose Tolerance in Pregnancy: Ethnic Variation and Influence of Body Habitus. 77
Glycosylated Hemoglobin Determination From Capillary Blood Samples: Utility in an Epidemiologic Survey of Diabetes. 165
Greater Influence of Central Distribution of Adipose Tissue on Incidence of Non-Insulin-Dependent Diabetes in Women Than Men. 32

Health Beliefs of Mexican, Mexican American and Anglo American Women. 33
Health Beliefs, the Significant Other and Compliance With Therapeutic Regimens Among Adult Mexican American Diabetics. 173
Health Care Utilization, Family Context, and Adaptation Among Immigrants to the United States. 17
Health Insurance Coverage and Utilization of Health Services by Mexican Americans, Mainland Puerto Ricans, and Cuban Americans. 187
Health Issues at the U.S.-Mexican Border. 195
Health Status of Diabetic Mexican Americans: Results From the Hispanic HANES. 171
Health Status of Hispanic Elders. 27

Hep-G2 Glucose Transporter Gene Polymorphism in Caucasian, Black, Hispanic and Japanese Patients With NIDDM. 156
High-Fat, Low-Carbohydrate Diet and the Etiology of Non-Insulin-dependent Diabetes Mellitus: The San Luis Valley Diabetes Study. 84
Higher Insulin and C-Peptide Concentrations in Hispanic Population at High Risk for NIDDM: San Luis Valley Diabetes Study. 58
Hispanic Americans Today. 3
Hispanic Cultural Influences on Medical Practice. 18
Hispanic Cultural Values: Implications for Groups. 185
Hispanic Elders in Texas: Implications for Health Care. 28
Hispanic Folk Medicine Utilization in Urban Colorado. 19
HLA Class II Alleles and Susceptibility and Resistance to Insulin Dependent Diabetes Mellitus in Mexican-American Families. 155
HLA-DQBeta57 in Hispanic Patients With Insulin dependent Diabetes Mellitus. 45
HLA-DRw Antigens in Mexican-American and Black-American Diabetic Patients. 46
Hyperdynamic Circulation and the Insulin Resistance Syndrome (Syndrome X). 106
Hyperinsulinemia as a Possible Etiology for the High Prevalence of Non Insulin Dependent Diabetes in Mexican Americans. 119
Hyperinsulinemia in a Population at High Risk for Non-Insulin-Dependent Diabetes Mellitus. 120

Impact of Associated Conditions on Glycemic Control of NIDDM Patients. 168
Improving Access to Health Care in Latino Communities. 194
Incidence of Gestational Diabetes: Effects of Race. 78
Incidence of Insulin-Dependent Diabetes Mellitus in Colorado. 47
Incidence of NIDDM and Impaired Glucose Tolerance in Hypertensive Participants: The San Antonio Heart Study. 59
Incidence of Treatment for End-Stage Renal Disease Attributed to Diabetes Mellitus, by Race/Ethnicity: Colorado, 1982-1989. 138
Incidence of Type II Diabetes in Mexican Americans Predicted by Fasting Insulin and Glucose Levels, Obesity, and Body-Fat Distribution. 60
Increased Incidence of Type II Diabetes Mellitus in Mexican Americans. 61
Increased Insulin Concentrations in Nondiabetic Offspring of Diabetic Parents. 121
Increased Prevalence of Clinical Gallbladder Disease in Subjects With Non-Insulin-Dependent Diabetes Mellitus. 150
Increased Risk for Gestational Diabetes Mellitus Associated With Insulin Receptor and Insulin-Like Growth Factor II Restriction Fragment Length Polymorphisms. 157
Increased Upper Body and Overall Adiposity Is Associated With Decreased Sex Hormone Binding Globulin in Postmenopausal Women. 98
Influence of Outpatient Insurance Coverage on the Microvascular Complications of Non-Insulin-Dependent Diabetes in Mexican Americans. 188
Insurance Coverage and Usage of Preventive Health Services. 189
Insuring Latinos Against the Costs of Illness. 24
Invited Commentary: Do Risk Factors Explain Ethnic Differences in Type II Diabetes? 62
Is There an Ethnic Difference in the Effect of Risk Factors for Diabetic Retinopathy? 112

Lack of Awareness and Treatment of Hyperlipidemia in Type II Diabetes in a Community Survey. 91
Longitudinal Prospective Study Among Puerto Rican Diabetic Patients. 63
Lp(a) Concentrations and Phenotypes in Children With Insulin-dependent Diabetes Mellitus. 158

Macrovascular Complications in Mexican Americans With Type II Diabetes. 132
Medical Expenditures and Insurance Coverage for People With Diabetes: Estimates From the National Medical Care Expenditure Survey. 190
Methods and Prevalence of Non-Insulin-Dependent Diabetes Mellitus in a Biethnic Colorado Population: The San Luis Valley Diabetes Study. 64
Mexican-American Mothers' Socialization Strategies: Effects of Education, Acculturation, and Health Locus of Control. 20
Mexican Americans: Factors Influencing Health Practices. 174
Microvascular Complications of NIDDM in Hispanics and Non-Hispanic Whites: San Luis Valley Diabetes Study. 147
Mortality Differences Between Elderly Mexican Americans and Non-Hispanic Whites in San Antonio, Texas. 29
Mortality in the Hispanic Population of Suffolk County, New York. 30
Mortality of Mexican Americans With NIDDM: Retinopathy and Other Predictors in Starr County, Texas. 65

NIDDM in Mexican-American Families: Heterogeneity by Age of Onset. 178
No Excess of DR3/4 in Ashkenazi Jewish or Hispanic IDDM Patients. 113
Non-Insulin-Dependent Diabetes and Obesity in the Black and Hispanic Population: Culturally Sensitive Management. 99

On the Role of Vitamin D Binding Globulin in Glucose Homeostasis: Results From the San Luis Valley Diabetes Study. 85
One Voice, One Vision: Recommendations to the Surgeon General to Improve Hispanic/Latino Health. 4
Origins of U.S. Hispanics: Implications for Diabetes. 114

Parental History of Diabetes Is Associated With Increased Cardiovascular Risk Factors. 115
Perceptions of the Importance Placed on Religion and Folk Medicine by Non-Mexican-American Hispanic Adults With Diabetes. 25
Physical-Activity-Assessment Measures Compared in a Biethnic Rural Population: The San Luis Valley Diabetes Study. 88
Physician Communication and Patient Compliance. 177
Predicting Diabetes: Moving Beyond Impaired Glucose Tolerance. 122
Predicting Future Diabetes in Latino Women With Gestational Diabetes: Utility of Early Postpartum Glucose Tolerance Testing. 79
Prevalence and Risk Factors of Diabetic Retinopathy in Non-Hispanic Whites and Hispanics With NIDDM: San Luis Valley Diabetes Study. 67
Prevalence of Coronary Heart Disease in Subjects With Normal and Impaired Glucose Tolerance and Non-insulin-dependent Diabetes Mellitus in a Biethnic Colorado Population: The San Luis Valley Diabetes Study. 133
Prevalence of Diabetes in Mexican Americans, Cubans, and Puerto Ricans From the Hispanic Health and Nutrition Examination Survey, 1982-1984. 68
Prevalence of Diabetes in Mexican Americans: Relationship to Percent of Gene Pool Derived From Native American Sources. 69
Prevalence of Selected Chronic Diseases Among the Mexican-American Elderly: Data From the 1982-1984 Hispanic Health and Nutrition Examination Survey. 70
Prevalence of Thyroid Autoimmunity in Insulin Dependent Diabetes Mellitus in the Bayamon Region. 48
Prevalence Rates for Diabetes Mellitus in Puerto Rico. 66
Proinsulin and Specific Insulin Concentration in High- and Low-Risk Populations for NIDDM. 71
Prospective Analysis of the Insulin-Resistance Syndrome (Syndrome X). 107

Proteinuria in Mexican Americans and Non-Hispanic Whites With NIDDM. 139
Providing Culturally Sensitive Health Care to Hispanic Clients. 172
Public Health Significance of Upper Body Adiposity for Non-Insulin Dependent Diabetes Mellitus in Mexican Americans. 100

Racial Differences in Incidence of Juvenile-onset Type 1 Diabetes: Epidemiologic Studies in Southern California. 49
Recent Developments in the Epidemiology of Diabetes in the Americas. 72
Relationship of Prevalence of Non-Insulin-Dependent Diabetes Mellitus to Amerindian Admixture in the Mexican Americans of San Antonio, Texas. 73
Relationship of Sex Hormone Binding Globulin to Overall Adiposity and Body Fat Distribution in a Biethnic Population. 101
Relationship of Sex Hormones to Hyperinsulinemia and Hyperglycemia. 134
Religious Attendance and Subjective Health. 26
Reproductive History, Glucose Tolerance, and NIDDM in Hispanic and Non-Hispanic White Women: The San Luis Valley Diabetes Study. 123
Risk Factors for Distal Symmetric Neuropathy in NIDDM: The San Luis Valley Diabetes Study. 142
Risk Factors for End-Stage Renal Disease Among Minorities. 140
Role of Obesity and Fat Distribution in Non-insulin-dependent Diabetes Mellitus in Mexican Americans and Non-Hispanic Whites. 102
Routine Screening for Gestational Diabetes in White, Black, and Mexican-American Teenagers. 80

Self-Management of Diabetes in a Puerto Rican Population. 182
Self-Reported Diabetes in Mexican Americans: HHANES 1982-84. 74
Sensory Neuropathy in Non-Insulin-Dependent Diabetes Mellitus: The San Luis Valley Diabetes Study. 81
Serum Lipids Within 36 Mo of Delivery in Women With Recent Gestational Diabetes. 92
Social Epidemiology of Overweight: A Substantive and Methodological Investigation. 103
Special Health Problems of Mexican-Americans: Obesity, Gallbladder Disease, Diabetes Mellitus, and Cardiovascular Disease. 104
Special Issues Regarding Obesity in Minority Populations. 105
Specific Hispanics. 5
Stability Over Time of Modern Diagnostic Criteria for Type II Diabetes. 166
Summary Report of Ad Hoc Working Group on Latino/Hispanic Outreach: Meeting and Recommendations for the National Eye Health Education Program's Latino/Hispanic Communication Plan. 148
Survival of Cadaveric Renal Allografts in Hispanic as Compared With Caucasian Recipients. 141

Traditional Mexican American Medicine and Hospital Practice. 21
Transcultural Family Nursing: Applications to Latino and Black Families. 184
Type II Diabetes Mellitus and Polymorphism of Insulin-Receptor Gene in Mexican Americans. 159

U.S. Hispanics: Challenging Issues for the 1990s. 6
Ultrasound Survey of Gallbladder Disease Among Mexican Americans in Starr County, Texas: Frequencies and Risk Factors. 151
Use of Fetal Ultrasound to Select Metabolic Therapy for Pregnancies Complicated by Mild Gestational Diabetes. 82
Use of Focus Groups to Explore Nutrition Practices and Health Beliefs of Urban Caribbean Latinos With Diabetes. 86

Author Index

The numbers in this index refer to item numbers not to page numbers.

Adams, R., 9
Aday, L.A., 179
Aguilar, C., 176
Aguilar, L., 51, 165
Aguilo, F., 63
Alderman, B.W., 88, 123
Aldrete, G., 158
Allen, C.R., 126
Allende, M.Z., 63
Altieri, P.I., 63
Amirani, J.J., 116
Angel, R., 14
Appiah, A.P., 144, 146
Arnaiz-Villena, A., 42
Aston, C.E., 152
Atkins, C.J., 87
Atwood, L.D., 153
Aubert, R.E., 124

Baker, S., 175
Banowsky, L.H., 141
Baranowski, T., 131
Barton, S.A., 51, 65, 151
Basch, C.E., 169
Bassford, T.L., 27
Baxter, J., 55-56, 64, 67, 81, 84, 88, 116, 123, 133, 142, 147, 154, 160
Becker, T.M., 52
Beckerman, S., 113
Bergman, R.N., 96
Bernal, H., 182
Bertin, T.K., 114
Beshkov, Y., 35, 155
Biddlecom, A.E., 17
Blackwell, J., 96
Blangero, J., 153
Bowsher, R.R., 71
Boyko, E.J., 50, 58, 123
Briones, E.H., 9
Brown, E.R., 24
Brunt, M., 86
Buchanan, T.A., 79, 82, 92
Bugawan, T., 155
Buono, M.J., 87
Burchfiel, C.M., 116
Burge, S.K., 70
Butt, K.M., 135

Cagliero, E., 49
Cai, Y., 47
Carballeira, N.P., 86
Cardenas, L., 175
Carosone-Link, P.J., 38
Carpenter, C., 113
Carter, J.S., 52
Castro, F.G., 33
Caudle, P., 172
Chakraborty, R., 73, 108
Chang, J., 155
Chase, H.P., 37-38, 43, 47
Chavez, L.R., 192
Chiapella, A.P., 136
Chipkin, S.R., 86
Cho, N.H., 76
Chu, H.H., 65
Cleary, P.D., 14
Cohen, J.A., 142
Cook, M., 38
Cooper, L.Z., 39
Cornelius, L.J., 193
Costas, R., 31
Costin, G., 34-35, 41, 155
Coulson, A., 92
Coultas, D.B., 95
Cousins, J.H., 20
Cowie, C.C., 164
Cruickshanks, K.J., 37, 43, 47
Cruz-Vidal, M., 31
Cumberland, W., 24

D'Eramo-Melkus, G., 99
Dailey, L., 180
Daskalakis, P., 135
Davies, T.F., 39
Davis, C., 6
Davis, R., 135
de Conty, I.T., 66
de la Rocha, C., 194
Delaney, V., 135
Delgado, M., 185

Diabetes Epidemiology Research International Group, 44
Diamond, M.P., 45
Diehl, A.K., 104, 149-150
Ding, Z., 135
Dobersen, M.J., 39
Dombrink, J., 192
Dooley, S., 157
Dooley, S.L., 76
Douglas, T.C., 151
Draznin, B., 156
Dunker, K., 83
Dunn, J., 96
Dunn, J.F., 98, 101, 134
Dunn, K., 131

Eastman, S., 34
Eberhardt, M.S., 164
Eifler, C.W., 13, 69, 137, 159, 163
Engel, S., 169
Erlich, H.A., 155
Esparza, B., 42
Espino, D.V., 28-29, 70
Every, N.R., 50
Ezzati, T.M., 68

Fedun, B., 39
Feldman, H.I., 136
Felice, M.E., 80
Ferguson, R., 140
Ferrannini, E., 115, 130, 168
Ferrell, R.E., 51, 73, 85, 152, 154, 165
Flegal, K.M., 68
Fong, D., 23, 145
Ford, E.S., 124
Fowkes, V.K., 181
Fowkes, W.C., 181
Franco, L.J., 162-163
Frangos, M., 158
Franklin, G.A., 147
Franklin, G.M., 81, 142
Frasier, S.D., 36, 46
Frazier, M.L., 159
Friedman, E.A., 135
Friedman, M.M., 184
Fulton, D.L., 55
Furth, P., 33

Galvan, A.Q., 168
Gamel, N., 181
Ganthier, R., 144
Garcia, C., 165
Garcia, C.A., 51, 65
Garcia-Palmieri, M.R., 31
Gardner, L.I., 69, 97
Garza, V., 126
Garza-Ibarra, A., 51
Gaskill, S.P., 69, 97, 126
Gay, E.C., 37-38, 43, 47
Giachello, A., 194
Gilson, G., 143
Gingerich, R., 71
Ginsberg-Fellner, F., 39, 113
Ginzberg, E., 191
Goldberg, R.B., 93
Goldstein, I., 36
Gomez, P., 194
Gonzales, J.L., 126
Gonzalez, C., 111
Gonzalez, M., 82
Gonzalez, R., 151
Graves, D., 36
Green, G.M., 57
Green, J.R., 77
Greenidge, K.C., 146
Gruber, K.K., 158
Gunczler, P., 42

Hackleman, S., 153
Haddock, L., 66
Haffner, S.M., 13, 23, 32, 59-61, 69, 71, 73, 89-91, 96-98, 100-102, 106-112, 115, 119-122, 125, 127-130, 132, 134, 137, 139, 145, 149-150, 153, 158-159, 162-163, 166, 168
Hall, T.A., 183
Hamman, R.F., 37-38, 43, 47, 50, 55-56, 58, 64, 67, 81, 84-85, 88, 116, 123, 133, 142, 147, 152, 154, 160
Hanis, C.L., 51, 65, 94-95, 114, 151, 165
Harris, M.I., 54, 68, 74, 164
Haskell, W.L., 88
Haynes, S.G., 68, 74
Hazuda, H.P., 13, 23, 32, 59-61, 69, 71, 73, 89-91, 97, 100, 102, 107-109, 111-112, 115, 120-122, 125, 127-129, 132, 139, 145, 149-150, 159, 162-163, 166, 188

Henry, O.A., 79
Herman, W.H., 124
Hernandez, L., 42
Hertzmark, E., 31
Hewett-Emmett, D., 65, 114, 151
Hildebrandt, W., 67
Hixson, J.E., 153
Hoag, S., 56
Hollingsworth, D.R., 75, 80
Hong, J.H., 135
Hopkins, R.S., 189
Howard, C.A., 95
Hubbell, F.A., 192
Hynak-Hankinson, M.T., 83

Indovina, K.A., 157
Iyengar, S., 85, 152, 154

Jensen, L., 17
Jewler, D., 1
Jobim, L.F., 43
Jones, R.H., 55
Joos, S.K., 94
Juarez, R.Z., 68, 74

Kahn, L.B., 64, 81, 116, 147, 160
Kamboh, M.I., 152
Kammerer, C.M., 153, 178
Karlow, H., 33
Kato, M., 93
Katz, M.S., 98, 101, 134
Keane, E.M., 50, 58
Kerber, C.A., 176
Key, C.R., 52
King, H., 53, 118
Kirshon, B., 78
Kjos, S.L., 79, 82, 92
Klag, M.J., 136
Klein, R., 112, 139, 145
Klingensmith, G., 38, 43
Klingensmith, G.J., 37, 47
Klitz, W., 155
Knapp, J.A., 102
Knowler, W.C., 68, 74
Kockum, I., 34
Kostraba, J.N., 37, 47
Kozlowski, M.K., 139
Krayer, K.J., 177
Krehbiel, R., 10
Kretchmer, N., 77
Kriehbiel, R., 29
Kubrusly, D.B., 151
Kubrusly, L.F., 151
Kumanyika, S.K., 105
Kumar, D., 46

Labor Council for Latin American Advancement, 186
Lanes, R., 42
Langbaum, M., 41
Lawler-Heavner, J., 37, 43
Lawson, K., 65
Layrisse, Z., 42
Leclere, F.B., 17
Lee, D.J., 171
Lee, G., 45
Lee, J., 45
Lee, N.A., 167
Lernmark, A., 34
Levin, J.S., 26
Lewin-Epstein, N., 22
Lezotte, D.C., 38, 64
Liriano, N., 2
Loon, J., 46
Lopez, T.K., 56
Lorenzi, M., 49
Lusk, M.W., 21

MacCluer, J.W., 153
Macheledt, J.E., 161
Maclaren, N.K., 41
Madrilejo, N.G., 82
Majumder, P.P., 85, 154
Maklad, M.N., 151
Malarcher, A.M., 124
Malina, R.M., 102
Markham, K.A., 123
Markides, K.S., 26, 171
Marshall, J.A., 50, 55-56, 58, 64, 67, 81, 84-85, 88, 116, 123, 133, 147, 154, 160
Marshall, S.M., 147
Mayer, E.J., 55, 64, 67, 88, 147
McEvoy, R., 113
McEvoy, R.C., 39
McMahan, C.A., 57, 163
McMillen, M.M., 74

Medina, A., 176
Mendoza, R.H., 15
Mestman, J.H., 92
Metzger, B.E., 76
Milbauer, M., 86
Mirowsky, J., 103
Mishra, S.I., 192
Mitchell, B.D., 32, 40, 59-61, 71-72, 90-91, 100, 107-109, 111-112, 115, 121-122, 125, 127-129, 132, 139, 149-150, 153, 159, 166, 168, 178
Mobley, M., 96
Mollen, N., 113
Monterossa, A., 71
Monterrosa, A., 109, 122
Montoro, M., 79, 92
Montoro, M.N., 82
Moo-Young, G.A., 67
Morales, P., 149
Morales, P.A., 59, 106-107, 122, 129
Moreno, C.A., 28, 70
Morgenstern, H., 24
Morrissey, E., 140
Moss, S.E., 112
Moyer, M.E., 187
Mueller, W.H., 94, 151
Mulrow, C.D., 176
Murakami, K., 156
Murphy, J.R., 64
Mykkanen, L., 71, 158

Nader, P.R., 87, 131
National Council of La Raza, 186
Nepom, G.T., 34
Neville, T.G., 37, 43
Nishida, K., 156
Notkins, A.L., 39
Nunez, V., 82

O'Brien, M.E., 143
O'Hair, D., 177
O'Hair, M.J., 177
Ober, C., 157
Olvera-Ezzell, N., 20
Orleans, M., 55, 64

Pachter, L.M., 7
Pantoja, P.M., 82
Parra, E.O., 29
Patterson, J., 112
Patterson, J.K., 23, 60-61, 89, 91, 100, 115, 120-121, 125, 127-128, 139, 145
Patterson, T.L., 87
Pawson, I.G., 77
Pelto, P.J., 2
Penny, R., 36, 46
Perez-Stable, E.J., 68, 74
Perry, J., 77
Peters, R.K., 79
Phillips, W.T., 57
Polednak, A.P., 30
Poma, P.A., 18
Ponchillia, S.V., 12
Posner, B.M., 86
Power, T.G., 20
Pressman, S., 155
Pugh, J., 89
Pugh, J.A., 120, 137, 139, 145, 188

Quatromoni, P.A., 86

Raboudi, S.H., 159
Raffel, L., 34
Raffel, L.J., 155
Rainwater, D.L., 158
Ray, L., 131
Raymond, N.R., 99
Reasner, C.A., 167
Regensteiner, J.G., 88
Reichert, D.F., 141
Reilly, M.D., 16
Reinhart, L.J., 178
Relethford, J.H., 69
Rentfro, A.R., 9
Rewers, M., 50, 53, 55, 118, 133
Rewers, M.J., 47
Riley, W.J., 41
Rivera, G., 8, 19
Rodriguez, J., 174
Rodriguez-Trias, H., 194
Roman, M., 2
Roman, S.H., 39
Rosalind, D., 131
Rosenthal, M., 73, 102, 162-163
Ross, C.E., 103
Rotter, J., 34

Rotter, J.I., 35, 41, 155
Rubinstein, P., 39, 113

Salas, R., 42
Sallis, J.F., 87
Samet, J.M., 52, 95
Samolsky, S., 83
Sanchez-Lugo, F., 48
Sanjeevi, C.B., 34
Santiago, J., 158
Saunders, P.H., 141
Schmidt, N.J., 49
Schull, W.J., 51, 65, 94, 114, 151, 165
Schumacher, L.B., 77
Schwartz, J.G., 57
Shamma, F.N., 45
Shamoon, H., 169
Shaw, S., 34, 155
Shaw, S.J., 35
Shetterly, S.M., 133, 142, 160
Shragg, P., 80
Shulman, I.A., 41
Skipper, B.J., 95
Smolowitz, J., 25
Snyder, R., 36
Sorlie, P.D., 31
Sosenko, J.M., 93
Soto, R., 93
Southward, G.M., 177
Spencer, M.R., 41
Stern, M.P., 13, 23, 32, 40, 59-62, 68-69, 71-74, 89-91, 96-97, 100-102, 104, 106-112, 115, 120-122, 125-130, 132, 134, 137, 139, 145, 149-150, 153, 159, 162-163, 166, 168, 178, 188
Stroheker, R., 38
Stroup-Benham, C.A., 187
Suciu-Foca, N., 113
Sumrani, N.B., 135
Surgeon General's National Hispanic/Latino Health Initiative, 4
Sussman, K.E., 156
Swenson, C.J., 56

Talamantes, M., 28
Tamez, E.G., 173
Taub, F., 39
Taylor, A.K., 190
Terasaki, P., 46
Thisted, R.A., 157
Tinker, L.F., 170
Todd, J.A., 43
Trevino, F.M., 187
Truscello, A.M., 80
Tuley, M.R., 188
Tulloch, B., 165
Tulloch, B.R., 51

Urdaneta, M.L., 10
Urrutia-Rojas, X., 179
US Department of Commerce, Economics and Statistics Administration, Bureau of the Census, 3
US Department of Health and Human Services, Public Health Service, Centers for Disease Control, 138
US Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases, 11
US Department of Health and Human Services, Public Health Service, National Institutes of Health, National Eye Institute, National Eye Health Education Program, 148

Vacalis, T.D., 173
Vadheim, C.M., 35, 41
Valdez, R., 108-109, 149, 158
Valdez, R.A., 59, 71, 106-107, 122, 129, 166
Valdez, R.B., 24, 187, 194
Valdivieso, R., 6
Vallbona, C., 175
Van Heuven, W., 23, 112, 145
Vanderpool, N.A., 131
Vaucher, Y., 75
Vernon, S.W., 161
Villalpando, E., 111

Wait, R.B., 78
Waitzkin, H., 192
Waldrop, R.H., 126
Walker, M., 113
Wallendorf, M., 16
Walters, E.G., 181
Wanderer, J.J., 8

Wang, C., 24
Warner, D.C., 195
Wason, C.J., 157
Wassmuth, R., 34
Watkins, N., 144
Weller, S.C., 7
Whelton, P.K., 136
Wiggins, C.L., 52
Wilk, J., 156
Williams, J.W., 176
Williams-Blangero, S., 108
Williamson, J., 158
Winsberg, M., 5
Witt, M.E., 39
World Health Organization, Ad Hoc Diabetes
    Reporting Group, 117-118
Wu, P., 82
Wylie-Rosett, J., 169
Wyn, R., 24

Xiang, A., 79, 82
Xiang, K.S., 157

Yagihashi, S., 39
Yamamoto, T.R., 75
Yoshimaru, H., 151
Yusim, S., 175

Zaldivar, A., 25
Zapata, M., 137
Zeidler, A., 34-35, 41, 46, 155
Zhang, J., 171

Subject Index

Selected subject terms are from the *Health Promotion and Education Thesaurus*
The numbers in this index refer to item numbers not to page numbers.

ACCULTURATION. 7, 10, 13-18, 20, 28, 30, 33, 171

ACQUIRED IMMUNODEFICIENCY SYNDROME. 172

ADOLESCENT PREGNANCY. 80

ADOLESCENTS. 15, 36, 38-39, 49, 80, 158

ADULT EDUCATION. 11

ADULTS. 15, 30, 94, 117-118, 158, 164, 189

ADVOCACY. 4

AEROBIC EXERCISE. 131

AFRICA. 53, 114, 118

AFRICAN AMERICANS. 14, 22, 24, 39, 46, 49, 53-54, 62, 68, 72, 76-78, 80, 99, 105, 114, 117-118, 124, 135-138, 140, 144, 156-157, 170, 175, 177, 184, 186-187, 189-190, 193

AGE FACTORS. 3, 6, 17, 24, 27-28, 47-48, 51, 53, 56, 60-61, 66, 70, 74, 76, 81, 92, 94, 112, 117-118, 129, 138-139, 142-143, 145, 158, 163-164, 175-176, 186, 189-190

ALCOHOL USE. 16, 28, 98, 142

AMERICAN DIABETES ASSOCIATION. 1, 11, 180

ANTHROPOLOGY. 2, 8, 12, 14, 16, 21, 33

ARIZONA. 16, 70, 74, 126

ARTERIOSCLEROSIS. 146

ARTHRITIS. 70

ASIAN AMERICANS. 24, 49, 76-77, 156, 177, 193

ASIANS. 53, 117-118

ASTHMA. 7

ATTITUDE DETERMINATION. 14, 181

ATTITUDES. 14, 181, 184

ATTITUDINAL BARRIERS. 194

BARRIERS. 28, 99, 148, 181

BARRIERS TO SEEKING TREATMENT. 10, 172, 174

BEHAVIOR CHANGE. 131

BEHAVIORAL RISK FACTOR SURVEYS. 189

BILINGUAL EDUCATION. 173

BIRTH DEFECTS. 39

BIRTH RATE. 6, 195

BIRTH WEIGHT. 76, 80, 195

BLOOD GLUCOSE. 31-32, 43, 49-51, 53-60, 68, 71, 76-82, 84-85, 89, 91-92, 96-97, 101-102, 107-109, 111, 115-120, 122-123, 125-127, 130, 133-134, 139, 142-143, 149, 152-154, 157-158, 161-163, 165, 167-170, 173, 175, 178

BLOOD PRESSURE. 31, 43, 50, 81, 106-107, 112, 115-116, 122, 130, 132-133, 139-140, 142, 145, 169-170

BODY MASS INDEX. 13, 23, 37, 43, 50, 55, 58-60, 71, 77, 80, 84, 87, 89-90, 93-96, 98, 100-103, 106-107, 110-111, 115-116, 119-123, 125, 127, 129, 132-133, 149, 152, 157, 159, 162

BODY SIZE. 37, 58-59, 64, 69, 75-76, 89-90, 93-94, 97, 102, 110-111, 119, 121, 123, 142, 149, 159, 162, 164, 168, 171

BRAZIL. 5, 72

BUSINESS AND INDUSTRY PARTICIPATION. 4, 11, 180

CALIFORNIA. 4-5, 11, 33-36, 41, 49, 70, 74-75, 77, 79-80, 87, 92, 104, 144, 160, 172, 183, 192

CANCER. 27-28, 104, 170

CARDIOVASCULAR DISEASES AND DISORDERS. 29, 61, 63, 65, 72, 104-106, 108, 127, 142, 170

CARDIOVASCULAR RISK FACTORS. 115-116, 125-126, 128, 131, 158

CARIBBEAN. 5, 68, 86, 114, 187

CATHOLICS. 26

CENSUS DATA. 3, 5, 114, 186

CENTRAL AMERICA. 72

CESAREAN SECTION. 75

CHILDREN. 3, 7, 19-20, 36, 38-39, 42, 47-49, 87, 158, 186

CHOLESTEROL. 28, 31, 89-92, 107-108, 115-116, 122, 126, 130, 133, 142, 146, 151-152, 167, 169-170

CHOLESTEROL SCREENING. 90-91, 168

CHRONIC DISEASES AND DISORDERS. 9, 28, 70, 138, 176

CHURCH PARTICIPATION. 26

CLINICS. 34, 37, 75, 80, 169

COALITION BUILDING. 180

COLLEGES AND UNIVERSITIES. 96, 177, 179

COLOMBIA. 5

COLORADO. 8, 19, 37-38, 40, 43-44, 47, 50, 55-56, 58, 62, 64, 67, 70, 74, 81, 84-85, 88, 104, 116, 123, 138, 142, 147, 152, 154

COMMUNICATION CHANNELS. 9

COMMUNICATION PROBLEMS. 18, 172

COMMUNICATION SKILLS. 18

COMMUNICATION STRATEGIES. 4, 9-10, 12, 18, 148, 177

COMMUNITY COORDINATION. 181

COMMUNITY HEALTH DIAGNOSIS. 179

COMMUNITY HEALTH EDUCATION. 1, 11, 83, 180

COMMUNITY HEALTH SERVICES. 179, 181

COMMUNITY LEADERS. 181

COMMUNITY WORKERS. 12

COMPARATIVE ANALYSIS. 3, 6, 14, 16, 22, 24, 27-31, 33-35, 39-40, 42-50, 53-57, 60-61, 64, 66-72, 74, 76-79, 81-82, 85, 88, 90-96, 98, 101-103, 105, 107-113, 116-120, 122-124, 126-129, 132-134, 137, 139, 141-142, 145, 150-160, 162, 167, 169-170, 175-178, 186-189, 192-193

CONFERENCES. 11, 148

CONNECTICUT. 2, 182

CONSUMERS. 16

COOKING TECHNIQUES. 180

CROSS CULTURAL ANALYSIS. 10, 14-15, 33, 184-185

CUBAN AMERICANS. 6, 40, 68, 72, 114, 180, 187, 191

CULTURAL INFLUENCES. 2, 7-16, 18, 21, 25, 33, 83, 99, 172-174, 181, 183-185, 194

CYTOLOGICAL TECHNIQUES. 46

DATA ANALYSIS. 47, 52, 59, 65, 68, 71-72, 79-82, 87, 92-93, 98, 100-101, 103, 105-107, 111, 124, 128-129, 138-139, 141-142, 151, 161, 163, 165

DATA COLLECTION. 4, 38, 49, 53-54, 59-60, 65, 74, 88, 106, 111, 117, 124, 129, 136, 165

DATABASES. 91

DEATH. 29-30

DEMOGRAPHIC STUDIES. 3, 5-6, 14, 38, 51, 55, 73-74, 161, 171

DENTISTS. 181

DEPRESSION. 171, 176

DEVELOPING NATIONS. 53, 118

DIABETES EDUCATION. 25, 148, 183

DIABETES EDUCATION PROGRAMS. 143, 173, 180

DIABETES MELLITUS. 9, 11-12, 25, 27, 29-30, 32, 35, 37-40, 43-44, 49-50, 52-56, 59-61, 68-71, 74-77, 79-80, 82, 84-86, 88-89, 92, 95-98, 102, 105-109, 111, 117-118, 120-126, 128, 132, 134, 136-138, 141, 143, 146-147, 150-151, 153-154, 160, 166, 169-171, 175-176, 178, 180, 188, 190

DIAGNOSIS. 38, 47, 56, 68, 71, 76, 79, 137, 144, 154, 157, 166, 168, 178

DIAGNOSTIC TESTS. 85, 144, 158, 171

DIET. 1, 16, 64, 82-84, 86, 90, 99, 131, 143, 168, 182

DIETARY ASSESSMENT. 86

DIETARY GUIDELINES. 99

DIETITIANS. 83

DISEASE PREVENTION. 4

DOMINICAN REPUBLIC. 5

EATING BEHAVIOR. 20

EATING DISORDERS. 170

ECUADOR. 5

EDUCATIONAL FACTORS. 6, 20, 23-25, 61, 172, 191

EDUCATIONAL METHODS. 9, 12, 20, 184-185

EL SALVADOR. 5

ELDERLY PERSONS. 3, 26-30, 70, 189

ELEMENTARY SCHOOL STUDENTS. 131

EMERGENCY MEDICAL SERVICES. 22, 193

EMPLOYMENT. 2, 24, 187

ENVIRONMENTAL HEALTH. 62, 195

EPIDEMIOLOGY. 1, 11, 27, 30-31, 36, 38, 40, 44, 47, 49, 51-52, 54-56, 59-61, 64-66, 68-70, 72-76, 91, 97, 108-109, 111, 117-118, 126, 128, 136, 139, 148-150, 153, 157, 164-165, 178, 189

ETHNIC GROUPS. 1-6, 8-25, 27-35, 37-41, 43-60, 62, 64-82, 84-124, 126-130, 132-142, 144-146, 148-157, 159-162, 167, 169-172, 175-182, 184-194

ETIOLOGY. 32, 39, 43-44, 57, 62, 76, 79, 84, 88-89, 102, 106, 114, 119-123, 136-137, 140, 154-155, 159, 178

EUROPE. 53, 113

EVALUATION. 6

EVALUATION METHODS. 88

EXERCISE. 86, 143, 180

EYE CARE. 148

EYE DISEASES AND DISORDERS. 12, 23, 63, 65, 67, 72, 112, 144-148, 171, 188

FAMILIES. 2, 6-7, 17-19, 26, 28, 35, 41, 87, 121, 155, 160, 172, 175, 178, 180, 184

FAMILY HEALTH. 184

FAMILY HISTORY. 31, 37-38, 41-42, 49, 55, 58, 62, 64, 93, 109, 113, 115-116, 120-121, 123, 157, 160, 164, 178

FAMILY PARTICIPATION IN TREATMENT. 18, 173

FAMILY SUPPORT. 28, 131, 174, 184

FATHERS. 109

FEDERAL GOVERNMENT. 4

FEMALES. 8, 19, 26, 32-33, 38, 48, 74, 76, 78-79, 88-89, 92, 98, 101-103, 109, 111, 117, 123-124, 126, 128, 134, 149-150, 157, 170, 184

FINANCIAL BARRIERS. 1, 194

FLORIDA. 4-5, 40, 54, 68, 93, 189

FOCUS GROUPS. 86, 148

FOLK MEDICINE. 12, 18-19, 21, 33, 174

FOOD. 16

GASTROINTESTINAL DISEASES AND DISORDERS. 104, 150

GENETIC DISEASES AND DISORDERS. 1, 11, 34, 39, 41-42, 44-46, 58, 73, 85, 104, 113-114, 130, 140, 152-153, 155-157, 159, 178

GENETIC SCREENING. 41, 45-46, 73, 113, 159

GERONTOLOGY. 26

GESTATIONAL DIABETES. 75-79, 82, 92, 143, 157

GLAUCOMA. 171

GLUCOSE TOLERANCE TEST. 23, 32, 50-51, 54-55, 58-59, 63-64, 68, 71, 73, 75-80, 84-85, 89, 93, 97, 102, 107, 109-112, 115, 119-123, 125, 133, 143, 146-147, 149-150, 152, 157, 160-166, 168, 178

GOITER. 36, 48

GROUP DISCUSSION. 185

GROUP DYNAMICS. 185

GUATEMALA. 5

HANDICAPPED. 28

HANDICAPS. 161

HEALTH BEHAVIOR. 8-9, 12, 14, 18-19, 21, 189

HEALTH BELIEFS. 8-9, 12, 18-21, 25-26, 33, 86, 99, 130, 140, 172-174, 177, 183

HEALTH CARE DELIVERY. 9, 172, 179, 181, 188, 191, 194-195

HEALTH CARE FACILITIES. 9

HEALTH CARE SERVICES. 9, 179, 181, 188, 195

HEALTH EDUCATION NEEDS. 4, 181, 191

HEALTH EDUCATION OBJECTIVES. 4

HEALTH EDUCATORS. 11, 99

HEALTH MESSAGES. 148, 177

HEALTH PLANNING. 9, 181

HEALTH PROFESSIONALS. 4, 148, 181, 191, 194

HEALTH PROMOTION. 4

HEALTH RISK APPRAISAL. 164, 180

HEALTH SERVICE ACCESSIBILITY. 1, 4, 22, 27-28, 99, 174, 179-180, 186, 190-195

HEALTH SERVICE UTILIZATION. 1, 14, 17, 22, 27-28, 174, 179, 186-187, 190, 193, 195

HEALTH VALUES. 183, 185

HEART DISEASES AND DISORDERS. 27-30, 70, 128, 133, 169-171, 176

HERPES SIMPLEX. 42

HIGH INCOME GROUPS. 32, 61, 69, 73, 97, 106, 110, 150

HIGH RISK BEHAVIOR. 172

HIGH RISK GROUPS. 99, 159, 172

HISPANIC AMERICANS. 1-30, 32-41, 43, 45-62, 64-109, 111-130, 132-157, 159-163, 166-194

HISPANICS. 44, 114

HOME VISITS. 20, 37

HOMICIDE. 30

HONDURAS. 5

HOSPITALIZATION. 9

HOSPITALS. 22, 25, 37, 49, 77, 83

HUMAN IMMUNODEFICIENCY VIRUS. 172

HYPERCHOLESTEREMIA. 168

HYPERTENSION. 9, 59, 63, 70, 95, 106-108, 112, 116, 126-127, 129-130, 132, 136, 139-140, 146-147, 151, 168-171, 176

ILLINOIS. 4, 11, 14, 22, 76, 157

IMMIGRANTS. 3, 5, 9, 17, 25, 174, 192, 195

IMMUNE SYSTEM. 36

INCOME. 6, 23-24, 103

INDIA. 118

INDIGENOUS HEALTH PRACTICES. 8, 12, 21, 99, 174

INDIGENOUS HEALTH SERVICES. 12, 19, 21

INDUSTRIAL WORKERS. 186

INFANT MORTALITY. 195

INFANTS. 75

INFORMATION DISSEMINATION. 177

INFORMED CONSENT. 45, 55, 165

INJURIES. 172

INNER CITY. 22, 25

INSTRUCTIONAL MATERIALS. 183

INSULIN. 37, 57-58, 71, 82, 85, 90, 96, 106-107, 112, 115, 119-122, 125, 134, 149, 153, 161

INSULIN DEPENDENT DIABETES MELLITUS. 34-49, 66, 104, 113, 135, 140, 148, 155, 158, 163, 169-170, 173, 182

INSURANCE COMPANIES. 24, 190

INTERNATIONAL COOPERATION. 195

INTERVENTION STRATEGIES. 12, 184

INTERVIEWS. 14, 20, 26, 32-33, 35, 38, 51, 54-55, 59-61, 64-65, 68-69, 74, 84, 87-89, 95, 97, 103, 116, 119-123, 125-126, 132-133, 147, 149-150, 157, 160-161, 165, 171, 175, 179, 181-182, 187-188, 190, 192-193

JEWISH PEOPLE. 113

KETOSIS (DIABETES). 46

KIDNEY DISEASES AND DISORDERS. 29, 40, 72, 135-138, 140-141, 147, 171

KNOWLEDGE MEASUREMENTS. 131, 148

LABORATORIES. 165

LANGUAGE BARRIERS. 1, 17-18, 148, 173-174, 194

LATIN AMERICA. 3

LAY HEALTH ADVISORS. 12, 180

LIFESTYLE. 15, 116, 184

LIMITED READING ABILITY. 183

LIPIDS. 90-92, 108, 115, 125, 127, 151, 158, 167-168

LITERACY. 9

LITERATURE REVIEWS. 8, 21, 104, 114, 136, 172, 184-185

LIVER CIRRHOSIS. 29

LOCAL GOVERNMENT. 4

LOCUS OF CONTROL. 20, 33

LONGITUDINAL STUDIES. 36, 65, 79, 129

LOW INCOME GROUPS. 1-3, 6, 10, 22, 24, 32, 61, 69, 73, 77, 97, 106, 110, 143, 148, 150, 163, 172, 174, 176, 178, 186-187, 191-192, 194-195

MALAYSIA. 118

MALES. 31-32, 38, 48, 74, 88-89, 102-103, 109, 111, 124, 126, 128, 150, 158, 184

MAMMOGRAPHY. 189

MARYLAND. 11

MASSACHUSETTS. 5, 86

MATERNAL AND INFANT HEALTH. 76, 79, 82, 92, 157

MEDICAID. 3, 24, 186-187, 190, 194

MEDICAL AUDIT. 169

MEDICAL COSTS. 10, 190

MEDICAL HISTORY TAKING. 49, 63, 90, 94, 146, 165, 178

MEDICAL INSURANCE. 17, 22, 40, 186-190, 192-193

MEDICAL RECORDS. 38, 47, 64, 67, 169

MEDICAL SCHOOLS. 181

MEDICALLY INDIGENT. 9, 24, 27, 174, 186-187, 193-194

MEDICARE. 3, 17, 136, 186, 190

MENTAL HEALTH. 2, 33

MEXICAN AMERICANS. 1, 6, 11-13, 16, 21, 23, 27-29, 33, 40-41, 46, 57-58, 60, 65-66, 68-72, 74-75, 79, 90-91, 96, 98, 101, 107, 111-112, 114, 129, 139, 145, 149, 151, 155, 159-163, 165, 168, 171-172, 174, 178, 180, 187, 191

MEXICO. 16, 21, 35, 68, 72, 80, 83, 103, 111, 114, 181, 187, 195

MICHIGAN. 5

MIDDLE INCOME GROUPS. 32, 61, 69, 73, 97, 106, 110, 134, 150, 163

MIDWIVES. 143

MIGRANT WORKERS. 5, 11

MINORITY GROUPS. 1-6, 9-17, 19-25, 27-28, 30-32, 34-35, 37-41, 43-44, 46-62, 64-81, 83-85, 87-89, 91, 93-100, 102-129, 132-142, 144-146, 148-157, 159-162, 167, 169-173, 175-194

MISSOURI. 158

MOBILE HEALTH UNITS. 32, 59, 69, 89, 119-120, 125, 128

MODELS. 15, 96, 122, 163

MORAL VALUES. 184

MORBIDITY. 27-28, 40, 80, 141, 161

MORTALITY. 27, 29-30, 40, 52, 65, 141

MOTHERS. 19-20, 75, 109

MULTIVARIATE ANALYSIS. 163

MYOCARDIAL INFARCTION. 128, 132

NATIONAL HEALTH PROGRAMS. 191, 194-195

NATIVE AMERICANS. 1, 10, 12, 52-53, 69, 72-73, 95, 104-105, 108, 114, 117, 126, 136, 140, 155, 170

NEEDS ASSESSMENT. 179

NEUROLOGICAL DISEASES AND DISORDERS. 81, 142, 147

NEW MEXICO. 52, 70, 74, 95

NEW YORK. 4, 25, 30, 39-40, 54, 68, 146, 169

NICARAGUA. 5

NONINSULIN DEPENDENT DIABETES MELLITUS. 1, 10, 13, 23, 27-28, 31-32, 37, 40, 51, 54-67, 69, 71-73, 75, 78-79, 81, 84, 86, 88-91, 93-95, 97, 99-102, 104, 106-112, 114-116, 119-123, 125, 127, 129-130, 132-133, 135-136, 139, 142, 144-145, 147, 149-152, 154, 156, 159, 161-170, 172, 188, 191

NORTH AMERICA. 53, 72

NURSE PATIENT RELATIONS. 9, 184

NURSES. 9, 184

NURSING EDUCATION. 184

NUTRITION. 9, 83-84, 86, 182

NUTRITION EDUCATION. 1, 99

NUTRITION EDUCATION PROGRAMS. 180, 183

OBESITY. 1, 13, 27, 31-32, 54, 61-63, 69, 71, 75-77, 80, 83, 93-100, 102-105, 107-108, 110, 115, 119-121, 125-127, 130, 134, 151, 157, 168-170, 175

OPHTHALMOLOGISTS. 67

PACIFIC ISLANDERS. 12, 53, 105, 117-118

PANAMA. 5

PAPANICOLAOU SMEAR TESTS. 189

PARENT PARTICIPATION. 7

PARENTS. 31, 109, 121

PATIENT COMPLIANCE. 7, 12, 167, 177

PATIENT EDUCATION. 12, 99, 177

PATIENT EDUCATION PROGRAMS. 143, 173

PATIENT SATISFACTION. 9

PATIENTS. 83

PEDIATRICS. 158

PENNSYLVANIA. 5

PERINATAL CARE. 76
PERSONAL HEALTH RECORDS. 91, 165

PHARMACEUTICALS. 7, 91

PHYSICAL ACTIVITY. 1, 10, 87-88, 116, 171

PHYSICAL EXAMINATIONS. 23, 31-32, 37, 50, 54, 59-60, 63-65, 69, 84, 89, 93, 97, 100, 102, 109, 112, 114, 116, 119-121, 123, 125, 132, 145, 147, 149, 153, 161, 171, 187

PHYSICIAN ATTITUDES. 181

PHYSICIAN PATIENT RELATIONS. 18, 177

PHYSICIAN RESPONSIBILITY. 28

PHYSICIANS. 91

PHYSICIANS OFFICE. 22, 188

POLICY MAKING. 4, 6

POPULATION GROWTH. 5

PORTUGAL. 44

POVERTY. 3, 6, 9, 70, 99, 148, 185-186

PRECEDE MODEL. 179

PREGNANCY. 75-80, 123, 143, 157

PREGNANT WOMEN. 75-80, 82, 92, 143, 157

PRENATAL CARE. 80

PREVENTIVE HEALTH SERVICES. 12, 189

PROFESSIONAL EDUCATION. 4, 172, 174, 181

PROGRAM EVALUATION. 180

PSYCHOLOGICAL RESEARCH. 15, 20

PSYCHOSOCIAL FACTORS. 8, 11, 14-15, 20, 33, 171, 185

PUBLIC HEALTH. 179, 181, 195

PUBLIC HEALTH DEPARTMENTS. 22, 66, 188

PUBLIC POLICY. 194-195

PUERTO RICANS. 2, 5-6, 22, 25, 27, 30, 40, 45, 48, 54, 63, 66, 68, 72, 83, 86, 114, 180, 182, 186-187, 191

PUERTO RICO. 3, 30-31, 63

QUALITY ASSURANCE. 9

QUANTITATIVE METHODS. 15, 88

QUESTIONNAIRES. 7-8, 19-20, 25, 37-38, 43, 66, 74, 88, 90, 95, 111, 113, 126, 133, 164, 177, 179, 187, 192

RECOMMENDATIONS. 4, 148, 191

RECOMMENDED DIETARY ALLOWANCES. 99

RECRUITMENT OF PARTICIPANTS. 64

REFERRAL SERVICES. 21, 180

REFUGEES. 195

REGISTRIES. 29, 37-38, 44, 47

RELATIVE WEIGHT. 31, 103

RELIGION. 8, 21, 26, 174, 184-185

RELIGIOUS ORGANIZATIONS. 25

RENAL DIALYSIS. 138

REPRODUCTIVE DISEASES AND DISORDERS. 101, 170

RESEARCH. 1-2, 7-8, 11, 13-14, 16-17, 19-20, 22-61, 63, 65-68, 70-82, 84-87, 89-92, 95-98, 100-107, 109-117, 119-130, 132-135, 137-142, 144-151, 153-157, 159-160, 162-171, 173, 175-178, 181-182, 185, 187-188, 190-193, 195

RESEARCH METHODOLOGY. 13, 15, 23, 36-37, 41, 45-46, 58, 62, 64-65, 68, 88, 90-91, 93, 108, 112-113, 131, 152, 159-163, 165, 168, 171, 173, 179, 187, 190

RESEARCH NEEDS. 4, 62

RESOURCE ALLOCATION. 4

RESOURCE MATERIALS. 1, 11

RISK FACTOR INTERVENTION. 138

RISK FACTORS. 1, 28, 39, 41-44, 48, 53-54, 56-57, 62-63, 65-67, 70-72, 76, 79, 81, 84, 92, 96, 98-99, 101, 105, 107, 112, 114, 116-117, 122, 124, 127, 129, 134-135, 137, 139-140, 142, 145, 153-154, 156, 164, 169-170, 176, 189

RISK REDUCTION PROGRAMS. 131, 143

RUBELLA. 39, 42

RURAL ENVIRONMENT AND POPULATION. 11, 31, 56, 66, 88, 108, 190

SAN ANTONIO. 1. 27, 29, 40, 71-73, 79, 98, 101, 107, 129-130, 139, 158, 178, 180

SANITATION. 195

SCHOOL COMMUNITY COOPERATION. 181

SCREENING. 76-77, 80, 93, 99-100, 160, 162, 164

SELF CARE. 182

SELF REPORTING. 14, 74, 124, 160-161

SELF TREATMENT. 7

SEX FACTORS. 13, 17, 24, 29-30, 32, 37-38, 47-48, 51-52, 55, 57, 64-66, 71, 74, 81, 85, 88-89, 100, 102-103, 106, 109, 111, 118-119, 124, 126, 128-129, 142, 151-152, 160, 189

SEXUALLY TRANSMITTED DISEASES. 195

SIBLINGS. 31, 42, 121

SINGLE PARENT FAMILIES. 2, 184

SMOKING. 28, 116, 124, 139, 142

SOCIAL ADJUSTMENT. 13

SOCIAL INFLUENCES. 8, 14

SOCIAL LEARNING THEORY. 131

SOCIAL PARTICIPATION. 22, 26

SOCIAL SUPPORT. 2, 26, 184

SOCIOCULTURAL PATTERNS. 2, 8-9, 12, 14, 16, 18, 21, 33, 83, 174, 183-184, 193

SOCIOECONOMIC STATUS. 2, 6, 10, 13-14, 23-24, 55, 61-62, 64, 69-70, 73, 102-104, 112, 118, 129, 171-172, 174, 191

SODIUM INTAKE. 131

SOUTH AMERICA. 5, 53, 72

SPAIN. 44, 114

SPIRITUAL HEALTH. 21, 25

STANDARDS AND CRITERIA. 71-72, 76, 79, 91, 107, 118, 139, 151, 162-163, 166, 168

STATE GOVERNMENT. 4, 186

STATISTICS. 3, 15, 30, 52, 74, 100, 136, 159, 163, 186

STRESS FACTORS. 2, 33

STROKE. 171

SUBURBAN ENVIRONMENT AND POPULATION. 108

SURVEILLANCE. 38, 47, 52, 54, 117, 136

SURVEYS. 8, 14, 17, 22, 27, 31-32, 40, 50, 54, 59, 61-62, 64, 66-68, 73-74, 89-91, 95, 100, 102-103, 106, 109-112, 115-116, 119-120, 124-126, 128, 132-134, 145, 147, 149-152, 161, 163-166, 168, 171, 174, 179, 187-188, 190, 192-193

TARGET GROUPS. 148, 180, 194

TELEPHONE SURVEYS. 65, 160, 189, 192-193

TESTS AND MEASUREMENTS. 15, 36-37, 41-42, 45-48, 57, 60, 70-72, 79, 81-82, 87-89, 92-93, 97-98, 100-102, 105, 107, 113, 118, 120-123, 125, 129, 132, 139, 141-142, 144, 146, 151, 155-159, 162, 165, 168, 173, 176

TEXAS. 1, 4-5, 9, 13, 20, 23, 26-29, 32, 40, 51, 57, 59-61, 65, 67, 69-74, 78, 89-91, 94-95, 97-98, 100, 102-104, 106-109, 111-112, 114-115, 119-120, 126, 128-130, 132, 134, 137, 139, 141, 143, 145, 149-151, 153, 158-159, 162-163, 165, 167-168, 175-179, 181, 188

THIRD PARTY REIMBURSEMENT. 189-190

TIME FACTORS. 6

TOBACCO USE. 63, 132-133, 139

TRANSPLANTATION. 135, 141

TRANSPORTATION. 174

TREATMENT PROGRAMS. 12, 25, 136, 138

TRENDS. 6, 52

TRIGLYCERIDES. 126, 167

UNDERSERVED COMMUNITIES. 181, 186

UNITED STATES. 5, 72, 118, 181, 195

URBAN ENVIRONMENT AND POPULATION. 2, 5, 11, 16, 22, 31, 66, 69, 86, 108, 169

URINE TESTING. 182

VALUE SYSTEMS. 183, 185

VENEZUELA. 42

VIOLENCE. 172

VOLUNTEERS. 180

WEIGHT CONTROL PROGRAMS. 99

WHITES. 1, 13-16, 22-24, 27-30, 33, 37-38, 40-41, 43, 46-47, 49-50, 52-62, 64, 67-69, 71-72, 76-78, 80-81, 84-85, 87-88, 90-91, 93, 95-98, 101-104, 106-107, 109-110, 112, 116-120, 122-124, 126, 128-129, 132-140, 142, 145, 147, 149-150, 152, 154-157, 159-160, 162, 166, 170, 175, 184, 186-189, 191-193, 195

WISCONSIN. 67, 112, 139, 145

WOMENS HEALTH. 143

WORKSHOPS. 4

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